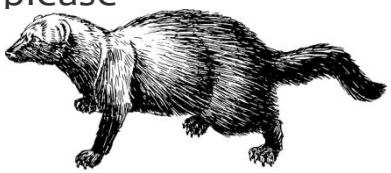
Maintaining fisher habitat in Sub-Boreal forests: opportunities for FN response to licensee proposals

Prince George February 17, 2017

Rich Weir, Ministry of Environment
Larry Davis, Davis Environmental Ltd.

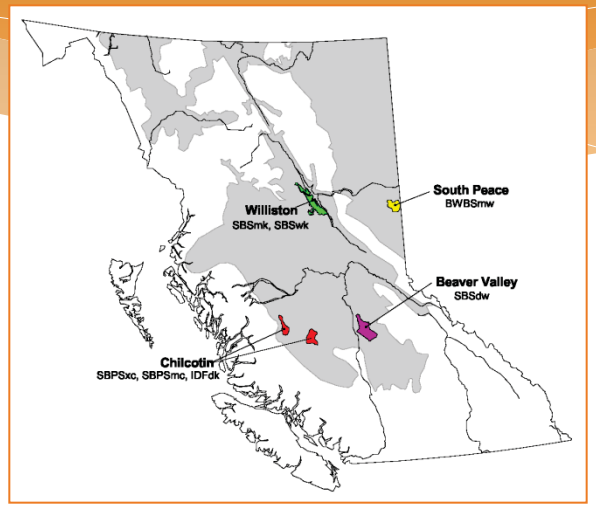
Usage and Disclaimer

1. This presentation contains specific information on habitat use of fishers (*Pekania pennanti*) in British Columbia based on research conducted in the province over the past 25 years.
2. Presentation content represents the best available information to preserve fisher habitat during forests management operations in B.C.
3. The information and guidance within is intended to inform resources professionals and is not to be interpreted as direction nor is it legally binding.
4. Some slides may be difficult to interpret without the additional context provided during the presentation. Please contact Rich Weir (Rich.Weir@gov.bc.ca) or other presenters listed on the title page, with any questions you may have.
5. This presentation may contain research findings that are subject to change as new information becomes available.
6. To find additional information and forest management planning tools please visit www.BCfisherhabitat.ca.



Who is the Fisher Habitat Working Group?

* Group of biologists from the 4 provincial fisher projects
* Extension specialists
* ***Common goal***



FORREX
Supporting Sustainable Natural Resource Management Decisions

ARTEMIS
WILDLIFE CONSULTANTS

Davis
Environmental Ltd.

LP
BUILDING PRODUCTS
BUILD WITH US.

HABITAT CONSERVATION TRUST FOUNDATION

FISH AND WILDLIFE COMPENSATION PROGRAM
A partnership between BC Hydro, the Province of B.C. and Fisheries and Oceans Canada

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

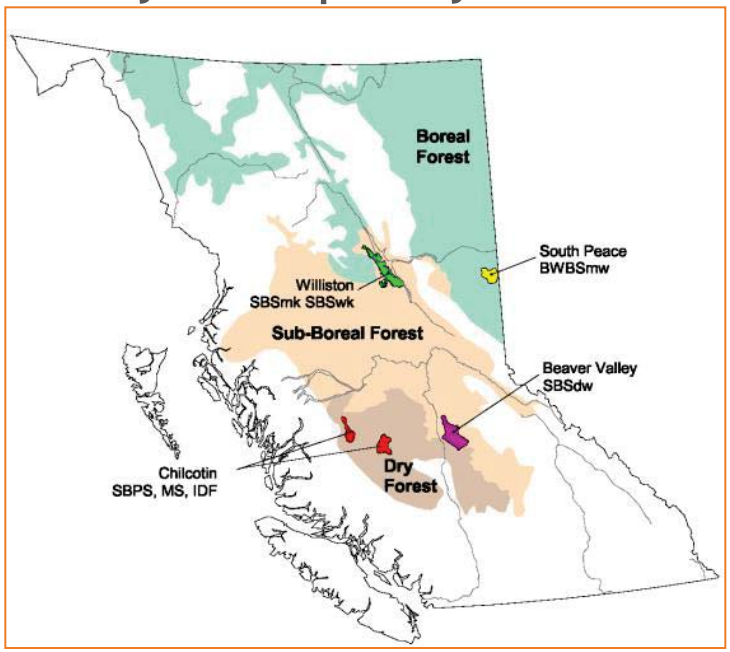
Fishers and forestry can co-exist (and need to co-exist)

* Fishers do not rely solely on late-successional forests
  - though, key habitat features are found in these forests
* Fisher is a blue-listed and *Identified Wildlife* species
  - IWMS (under FRPA) requires that limiting habitats will be maintained
* Forest harvesting is an integral part of BC's economy
  - but, it "needs" to meet environmental standards (i.e., third-party forest certifications)
  - common tenet of certifications - biological diversity is conserved and wildlife habitat is maintained

Why does the Extension Initiative exist?

***Common goal*:**

* Get the information learned from the 4 projects out to the people that can affect the quantity and quality of fisher habitat
* Thus, aiding in the conservation, recruitment, and enhancement of fisher habitat in British Columbia



Outline

- Fishers in BC
- Forests and Forestry in BC
- What does fisher habitat look like?
- Tools to help develop referral responses that conserve fisher habitat in forestry operations
  - Note: These efforts will also help conserve other furbearers

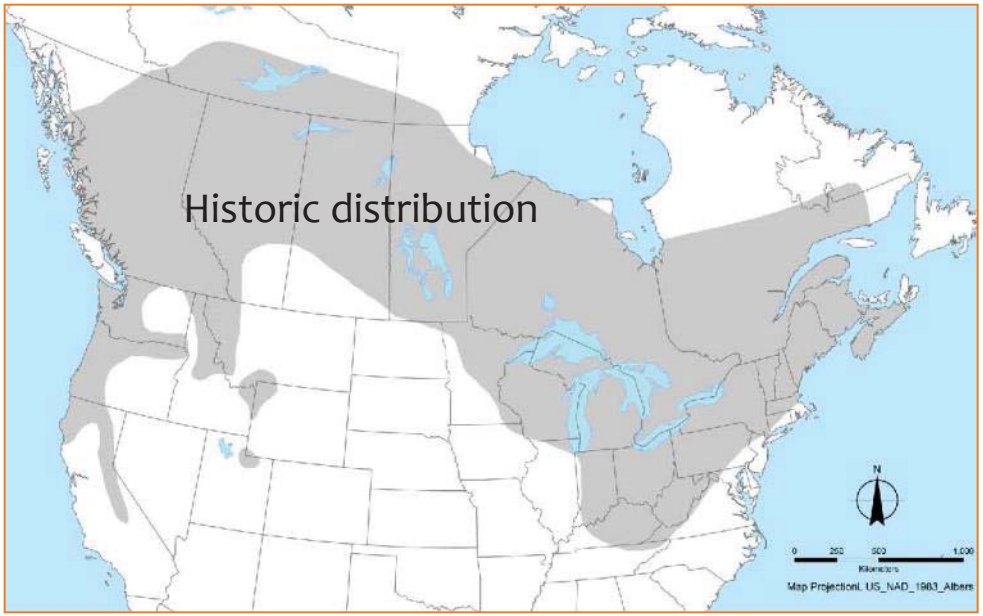
Outline

- Fishers in BC
- Forests and Forestry in BC
- What does fisher habitat look like?
- Tools to help develop referral responses that conserve fisher habitat in forestry operations
  - Note: These efforts will also help conserve other furbearers

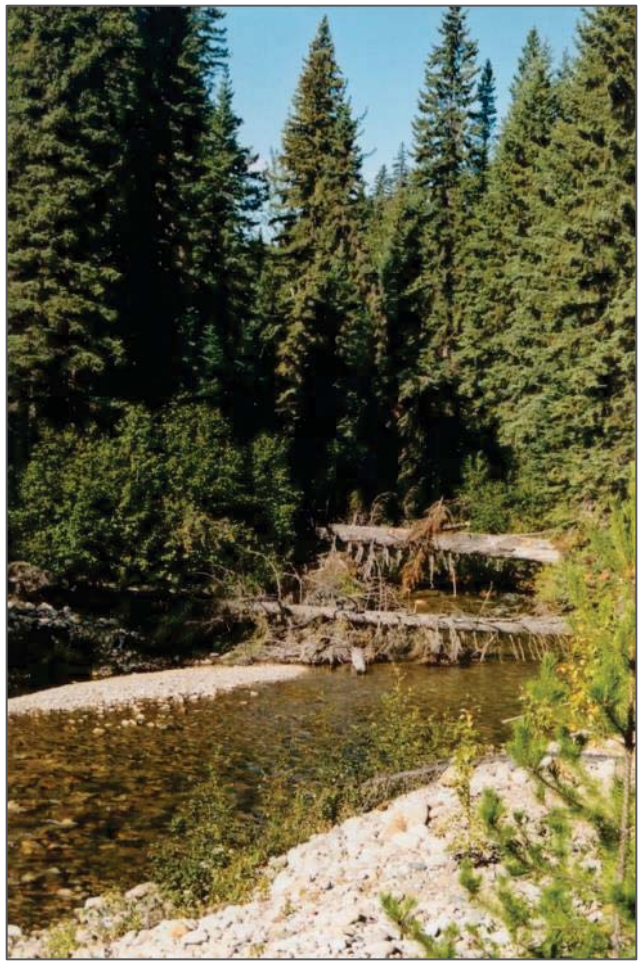
What is a fisher?

- Member of the weasel family
- About the size of housecat
  - Males weigh ~3.5 – 5 kg; 90-120 cm in length
  - Males ~2 – 3 kg; 75-95 cm in length
- Designed for semi-arboreal lifestyle
  - 5 toes with retractable claws, relatively large feet

Distribution in BC and across North America



Strong Association with Forests and Forest Structure



- Require forest cover
- Riparian stands important
- Often associated with deciduous trees/stands
- Elements of old forest important (large trees, large woody debris, and complex structure)
- Reflect habitats of prey species

Fishers don't fish: Diet

- Opportunistic predator
- Prey on mid – small sized mammals, birds, reptiles, insects, and plant material.
- Ungulate carrion used extensively when available
- Snowshoe hare, red squirrels, and mice most often consumed prey in BC

Fisher Life Cycle

* Live 4-6 years for males, 5-8 years females
* Females produce 3-4 litters of 2-3 kits during lifetime
* Dispersal of young occurs between fall and next spring, but may take up to 2 years
* Survival of adults is ~80% year-to-year, ~50% for kits to one year

Status in British Columbia

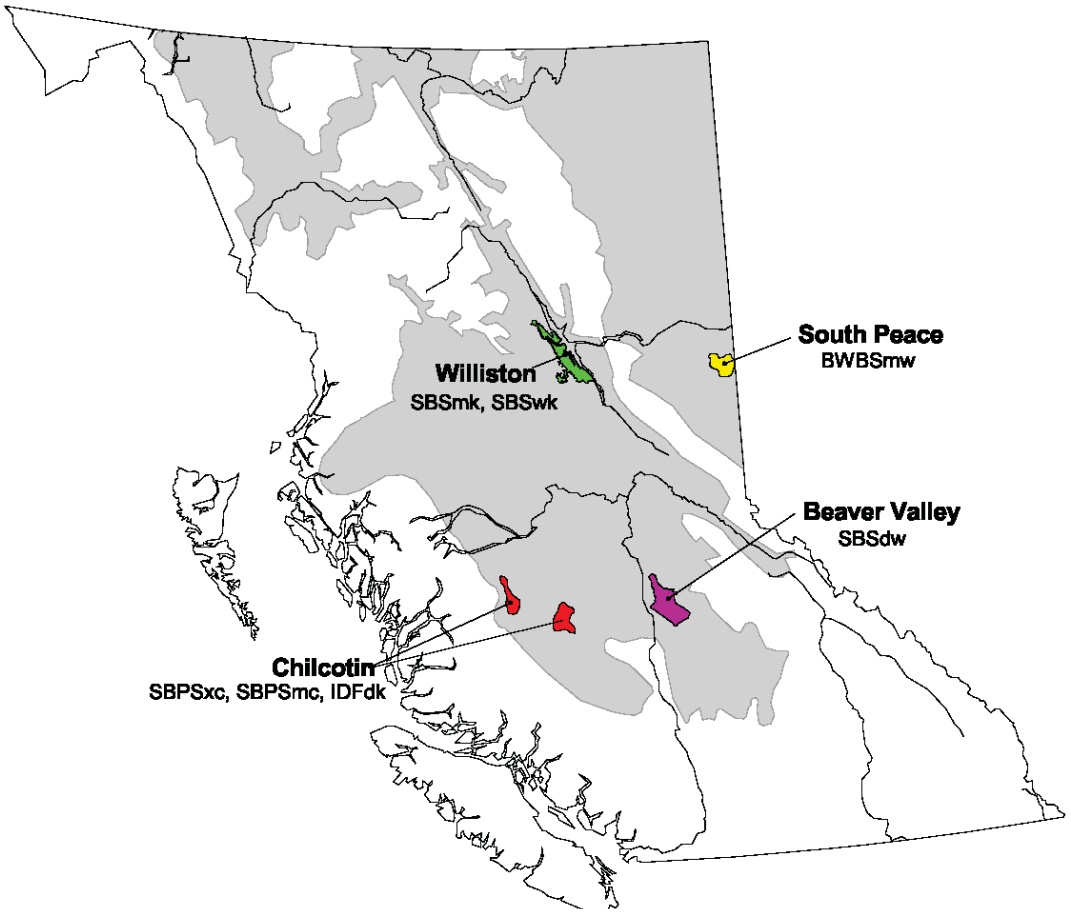
- *Identified Wildlife* and Blue-listed in BC (S2S3) with population estimate of fewer than 3800 animals.
- Legally harvested as a “furbearer” in Central & Northern BC, but closed to trapping in Southern BC.
- Trend – projected population decline in short and long term.
- Vulnerable to habitat loss and trapping.

Why be concerned about fishers?

- Closely associated with structural features of late-successional forests
- Short legs, big territories
- Don't respond well to habitat change:
  - Low density
  - Low reproductive capacity
- Regulatory requirements

What we know about fishers in BC

1. Beaver Valley [SBSdw]
   - 1990-1993
   - 19 fishers
2. Williston [SBSmk, SBSwk]
   - 1996-2000
   - 22 fishers
3. Chilcotin [SBPSxc, SBPSmc, IDFdk]
   - 2005-2009
   - 24 fishers
4. South Peace [BWBSmw]
   - 2005-2009
   - 24 fishers



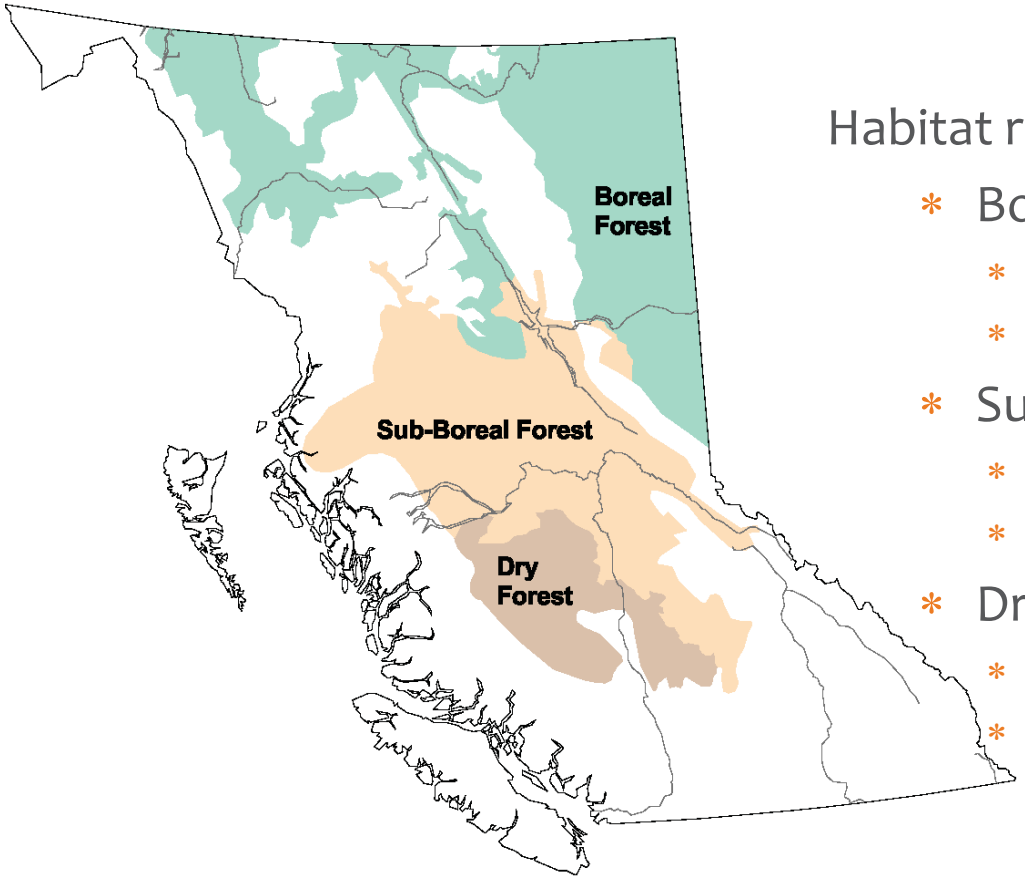
Sub-Boreal fisher studies: Major findings

- Density of ~8.8 fishers/1,000 km^2
- Home ranges very large (F: 25-50 km^2, M: 160-210 km^2)
- Large portions of landscape not suitable for home ranges
- Fishers closely tied to large, uncommon forest structures for reproduction and resting:
  - Large declining cottonwood trees used as reproductive dens
  - Rust brooms in hybrid spruce commonly used for resting, but also used cavities in large aspen and cottonwoods
  - Large pieces of woody debris important during periods of extreme cold

Boreal fisher studies: Major findings

- Density of ~16.3 fishers/1,000 km^2
- Home ranges fairly large (F: 30 km^2, M: 210 km^2)
- More of landscape is suitable for home ranges than elsewhere
- Fishers *still* closely tied to large, uncommon forest structures for reproduction and resting:
  - Large declining aspen and balsam poplar trees used as reproductive dens
  - Rust brooms in white spruce and black spruce commonly used for resting, but also used cavities in large aspen and balsam poplars
  - Woody debris piles and animal burrows important during periods of extreme cold

Fishers and Forests in BC



Habitat relationships vary by forest region:

* Boreal forests
  * BWBS zone
  * Cold, dry climate
* Sub-boreal forests
  * SBS zone
  * Cold, moist climate
* Dry forests
  * SBPS, MS, and IDF zones
  * Cool, very dry climate

Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

Main impacts are from loss of large old structures found mostly in late-successional forests

Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

Main impacts are from loss of large old structures found mostly in late-successional forests

Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

Main impacts are from loss of large old structures found mostly in late-successional forests

Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

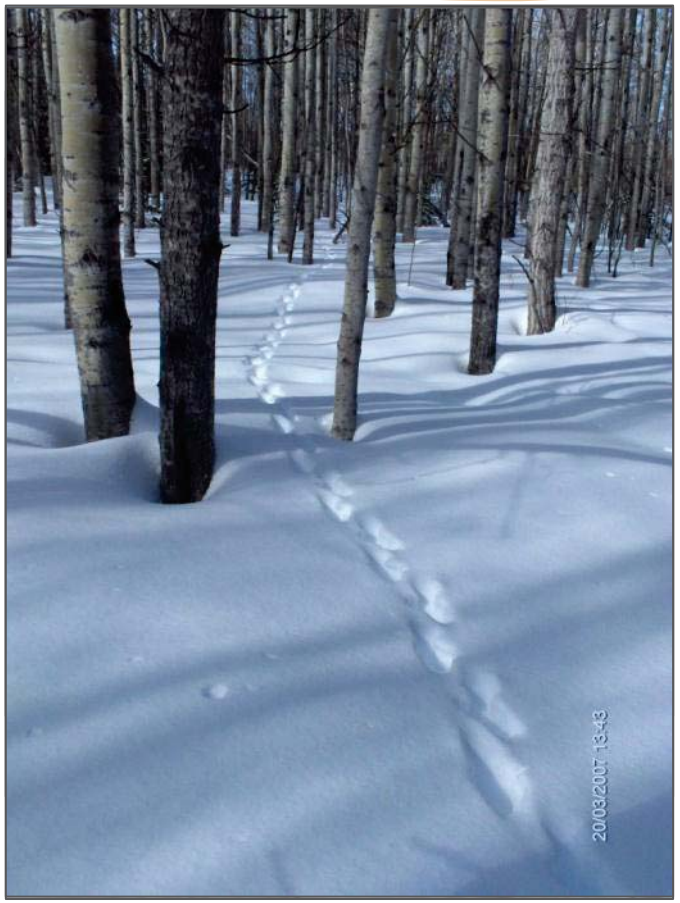
Main impacts are from loss of large old structures found mostly in late-successional forests

Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

Main impacts are from loss of large old structures found mostly in late-successional forests



Forest Management and Fishers

Forest harvesting and other management affects these 4 habitats for fishers:

* Denning
* Resting
* Foraging
* Movement & Dispersal

Main impacts are from loss of large old structures found mostly in late-successional forests

Challenges

* Some forest activities can remove habitat needed by fishers for a significant time period.

Opportunities

* Other forest activities can enhance habitat for some activities (e.g., snowshoe hare habitat, CWD resting habitat)

Opportunities

* The trees and structures that fishers actually need are quite different than what the mills like to get.

Fisher Habitat Extension Program

What do we want to achieve?

Sufficient habitat is maintained and recruited to support a sustainable population of fishers in British Columbia.

Fisher Habitat Extension Program

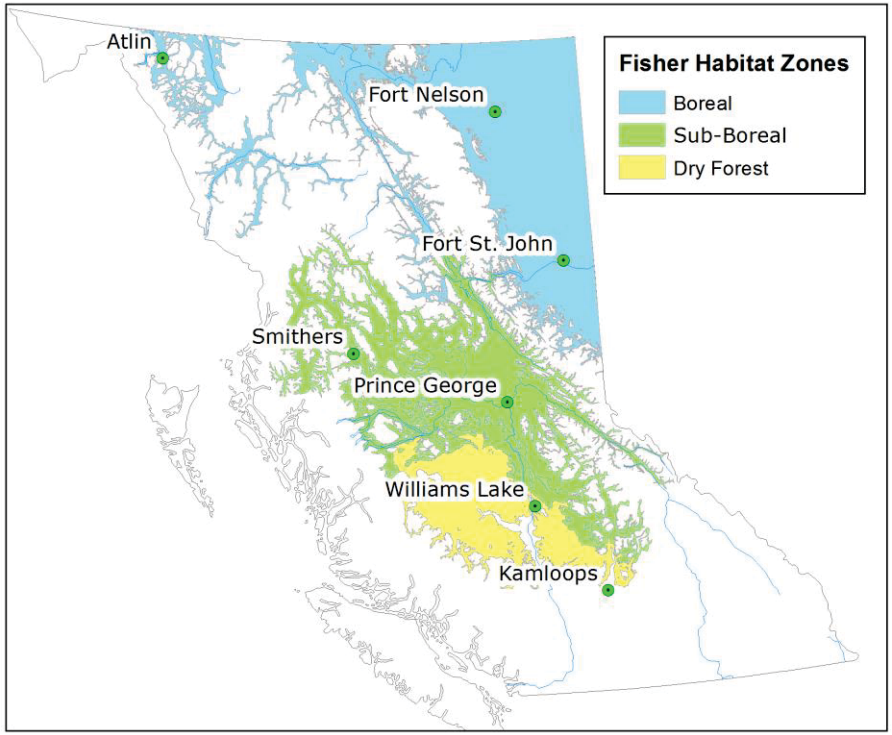
What do we want to achieve?

Sufficient habitat is maintained and recruited to support a sustainable population of fishers in British Columbia.

Long-term Outcome

Fisher Habitat Zones

- Habitat relationships vary by forest region
- BC divided into 3 Habitat Zones
  - Boreal forests
    - BWBS zone
    - Cold, dry climate
  - Sub-Boreal forests
    - SBS zone
    - Cold, moist climate
  - Dry forests
    - SBPS, MS, and IDF zones
    - Cool, very dry climate



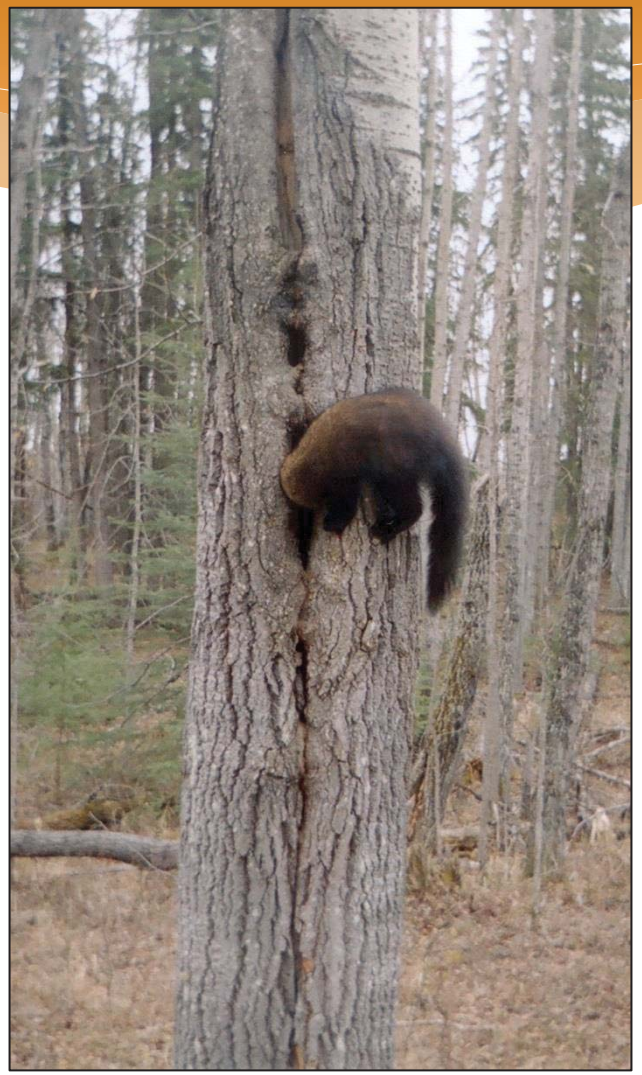
What is Fisher Habitat?

* Occurs at a bunch of different scales ranging from single trees to whole landscapes
* Is different for different activities:

Denning Resting Foraging Movement

1) Denning Habitat

- Dens in heart rot cavities of large-diameter trees
- Forest cover at den sites generally >25%
- Habitats characteristics at den trees dependent on the tree species
- Often use more than one den tree for raising a litter
- Den trees re-used among years



2) Resting Habitat

* Generally habitats with tree cover, spruce most often used tree species
* Rest trees generally larger than other trees in a patch and have structures associated with disease or decay
* Ground rest site use linked to cold weather, larger diameter logs, and snow cover

3) Foraging Habitat

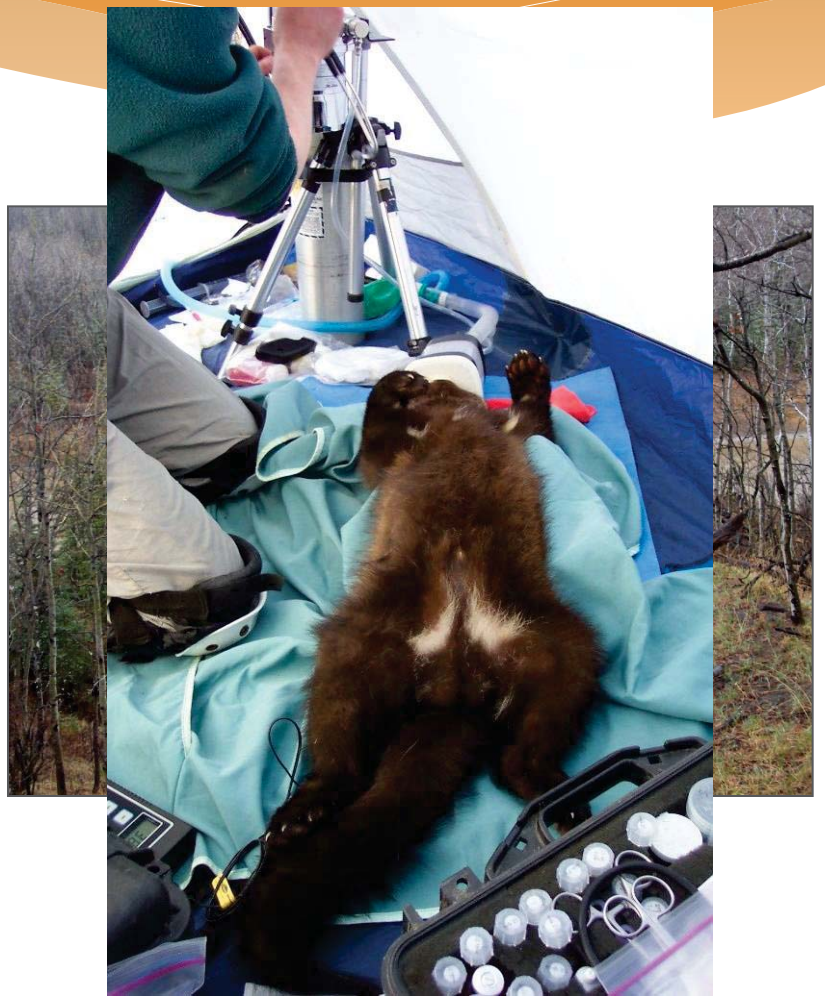
- Reflects habitats of primary prey species, but always with forest cover
- Young stands with sufficient tree cover for abundant snowshoe hare populations can also be used

4) Movement & Dispersal Habitat

* Forest cover with escape terrain (e.g., larger trees or complex woody debris)
* Will cross narrow openings (e.g., 50 m)
* Need to provide connectivity along riparian areas and to upland habitats

What do fishers need?

1. Collect information on fishers
   - Capture, radiotag and monitor fishers to:
   a) Identify the structures used by fishers for rearing offspring and resting.
   b) Identify the stands used by fishers for rearing, resting, foraging, and movement.
   c) Determine the size and composition of the home range of each tagged fisher.



What do fishers need?

1. Collect information on fishers
   - Capture, radiotag and monitor fishers to:
   a) Identify the structures used by fishers for rearing offspring and resting.
   b) Identify the stands used by fishers for rearing, resting, foraging, and movement.
   c) Determine the size and composition of the home range of each tagged fisher.

What do fishers need?

1. Collect information on fishers
   - Capture, radiotag and monitor fishers to:
   a) Identify the structures used by fishers for rearing offspring and resting.
   b) Identify the stands used by fishers for rearing, resting, foraging, and movement.
   c) Determine the size and composition of the home range of each tagged fisher.

What do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers

What do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers
   a) Characterize the MINIMUM STRUCTURAL ATTRIBUTES of rearing and resting sites
   b) Characterize HIGH-QUALITY STAND ATTRIBUTES of stands used by fishers [spatial data]
   c) Estimate density of structures with "minimum structural attributes" in "high-quality stands"

What do fishers need?

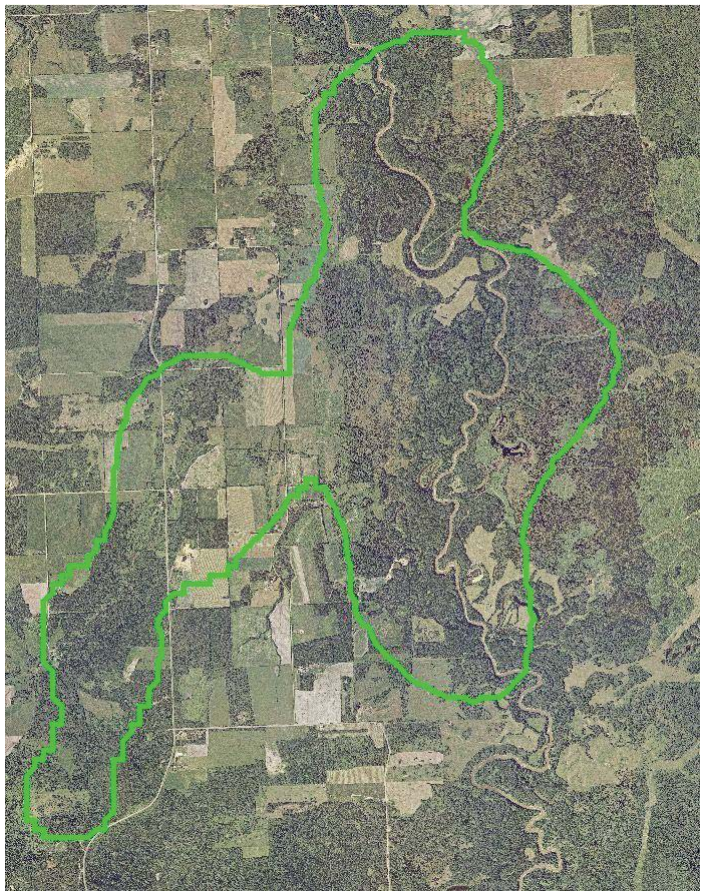
1. Collect information on fishers
2. Measure habitats used by fishers
   a) Characterize the MINIMUM STRUCTURAL ATTRIBUTES of rearing and resting sites
   b) Characterize HIGH-QUALITY STAND ATTRIBUTES of stands used by fishers [spatial data]
   c) Estimate density of structures with "minimum structural attributes" in "high-quality stands"

How much do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers
3. Estimate targets

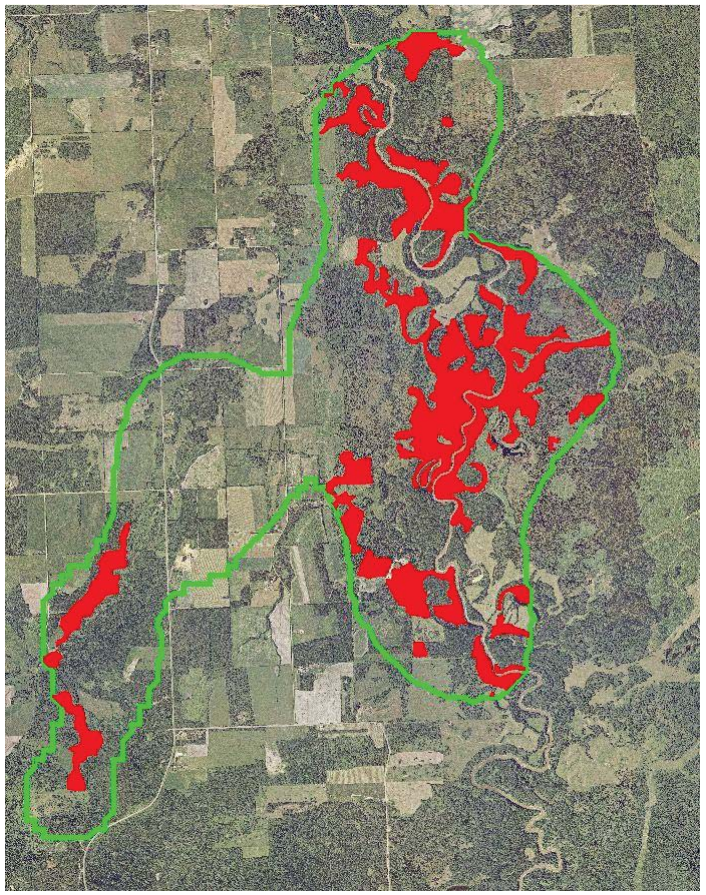
How much do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers
3. Estimate targets
   a) Estimate the MINIMUM DENSITY of "high-quality stands" needed for each behaviour within each home range
   b) Estimate the TOTAL NUMBER OF STRUCTURES that need to occur within the home range.



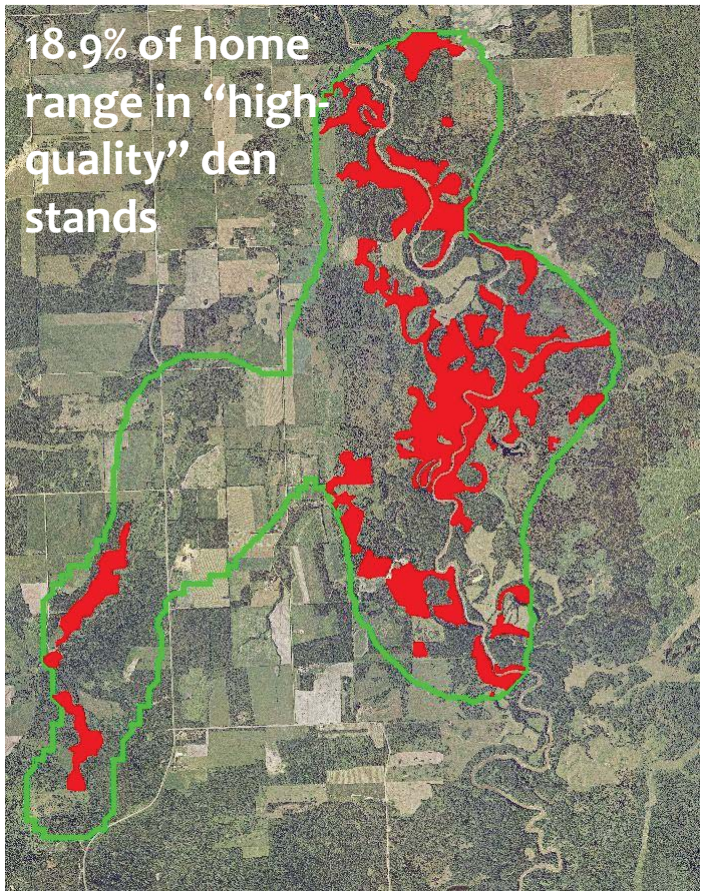
How much do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers
3. Estimate targets
   a) Estimate the MINIMUM DENSITY of "high-quality stands" needed for each behaviour within each home range
   b) Estimate the TOTAL NUMBER OF STRUCTURES that need to occur within the home range.



How much do fishers need?

1. Collect information on fishers
2. Measure habitats used by fishers
3. Estimate targets
   a) Estimate the MINIMUM DENSITY of "high-quality stands" needed for each behaviour within each home range
   b) Estimate the TOTAL NUMBER OF STRUCTURES that need to occur within the home range.



Conditions and Targets

Used field data collected on fishers to:

Desired Habitat Conditions

1. Identify the minimum characteristics of trees used by fishers for denning and resting.
2. Identify stands that are used most commonly for each activity (Type I stands).
3. Identify the minimum density of these stands that support fishers.
4. Estimate the number of structures[1] that fishers need within home ranges.

[1] that meet minimum criteria of (1)

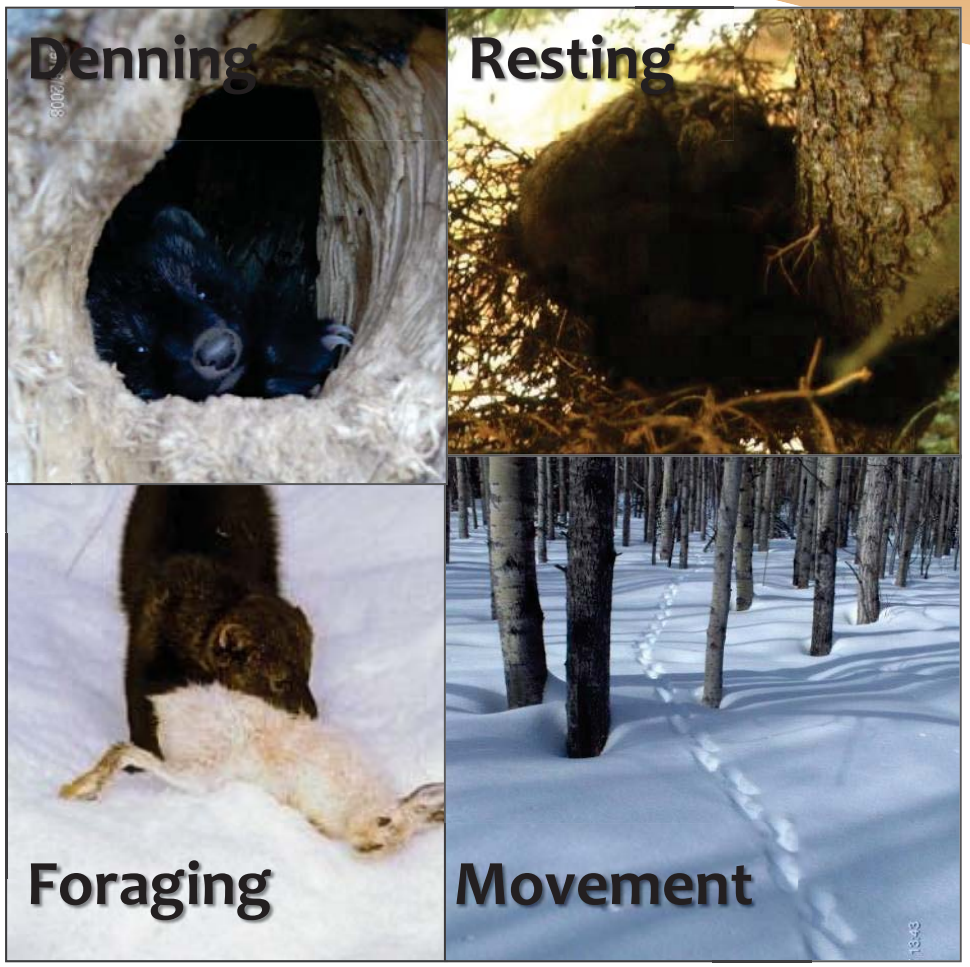
Conditions and Targets

Used field data collected on fishers to:

Desired Habitat Conditions	1. Identify the minimum characteristics of trees used by fishers for denning and resting. 2. Identify stands that are used most commonly for each activity (Type I stands).
Targets	3. Identify the minimum density of these stands that support fishers. 4. Estimate the number of structures[1] that fishers need within home ranges.

[1] that meet minimum criteria of (1)

Conditions and Targets



Have been identified for:

- Each habitat need
- Each Fisher Habitat Zone
  - Boreal
  - Sub-Boreal
  - Dry Forest
- For multiple planning and operational scales

Conditions and Targets

Provide forestry personnel with an idea of:

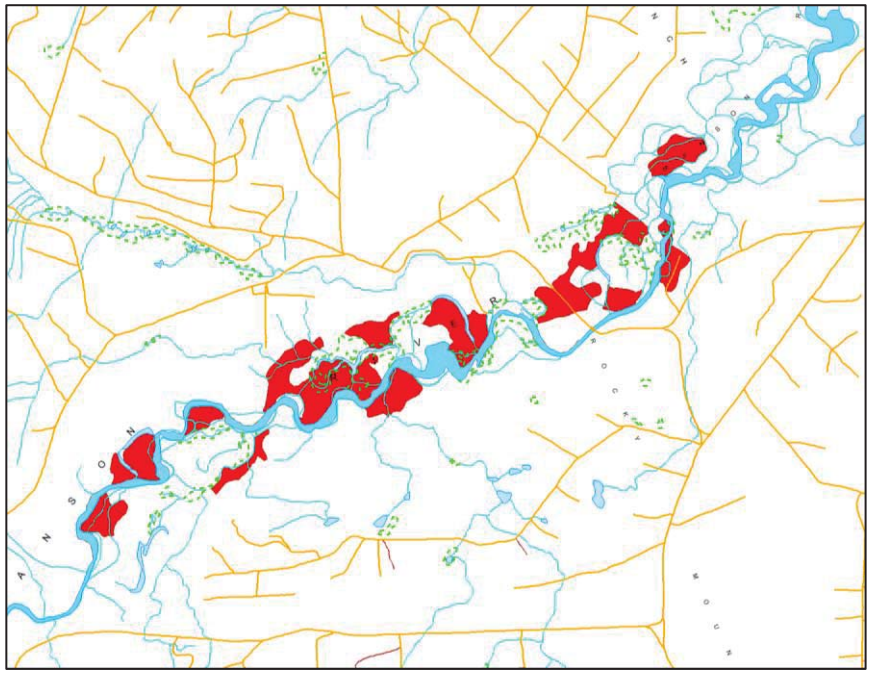
- What good fisher habitat looks like
- How much of it is needed by fishers

Used to provide guidance to help make operational decisions in fisher habitat

Where's the good stuff? Type I stands in the landscape

Use VRI attributes of stands that account for the majority of use by fishers for each behaviour → **TYPE I stands.**

* Denning
* Resting in rust brooms
* Resting in cavity trees
* Resting in CWD
* Foraging for



What does Spatial Data look like?

1. Entire Habitat Zone categorized into Type I and Type II stands for each habitat need.
2. Density of Type I stands within a typical fisher home range is calculated.
3. Determination is made as to whether this density is above, near, or below that which usually supports a female fisher.

What does Spatial Data look like?

Stand Condition

1. Entire Habitat Zone categorized into Type I and Type II stands for each habitat need.
2. Density of Type I stands within a typical fisher home range is calculated.
3. Determination is made as to whether this density is above, near, or below that which usually supports a female fisher.

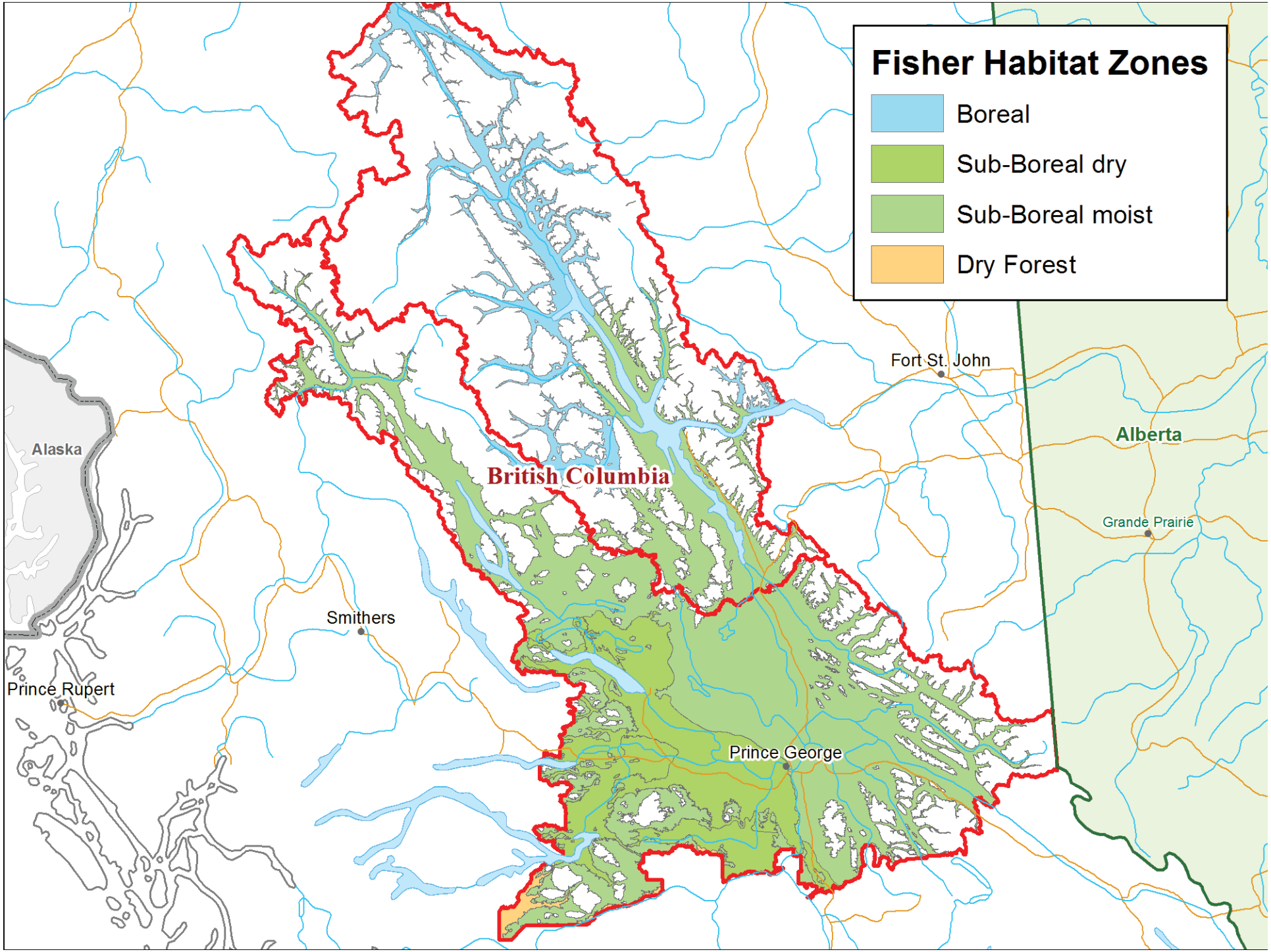
What does Spatial Data look like?

Stand Condition

1. Entire Habitat Zone categorized into Type I and Type II stands for each habitat need.

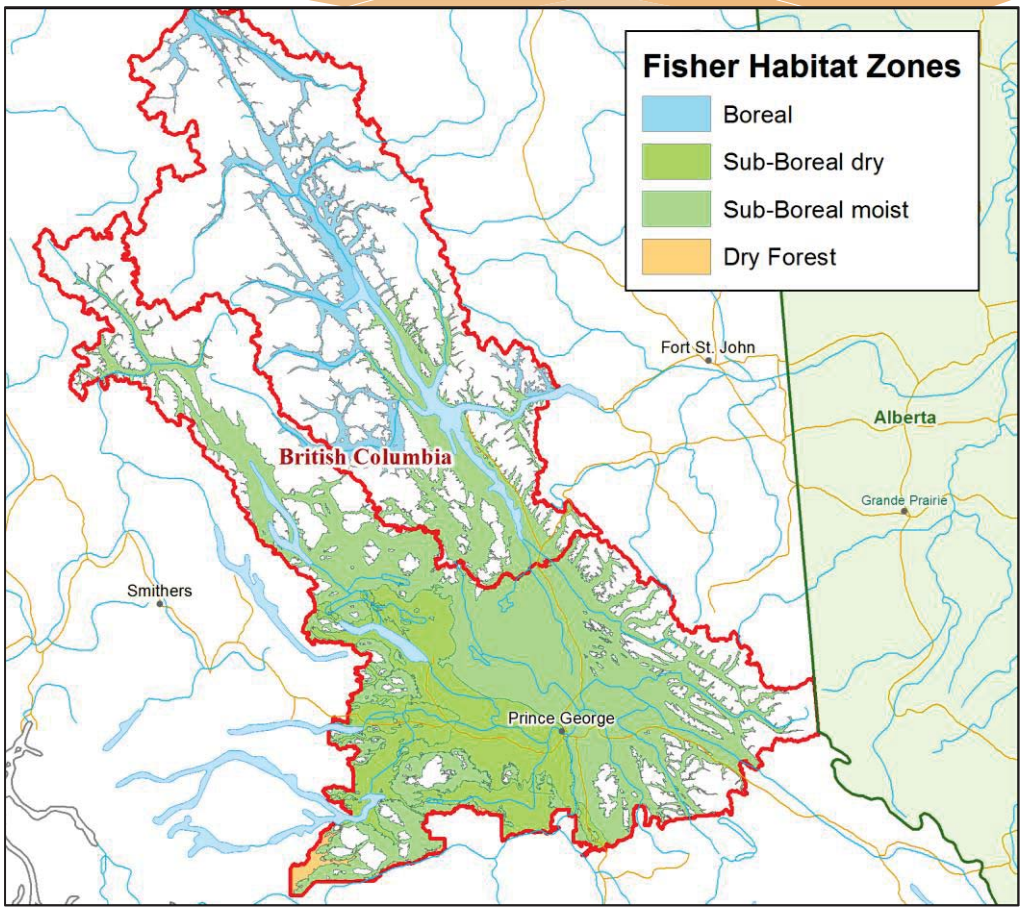
2. Density of Type I stands within a typical fisher home range is calculated.
3. Determination is made as to whether this density is above, near, or below that which usually supports a female fisher.

Landscape Condition


Fisher Habitat Zones
Boreal
Sub-Boreal dry
Sub-Boreal moist
Dry Forest
Alaska
British Columbia
Alberta
Fort St. John
Grande Prairie
Smithers
Prince Rupert
Prince George

Complete spatial data set is available for each Habitat Zone

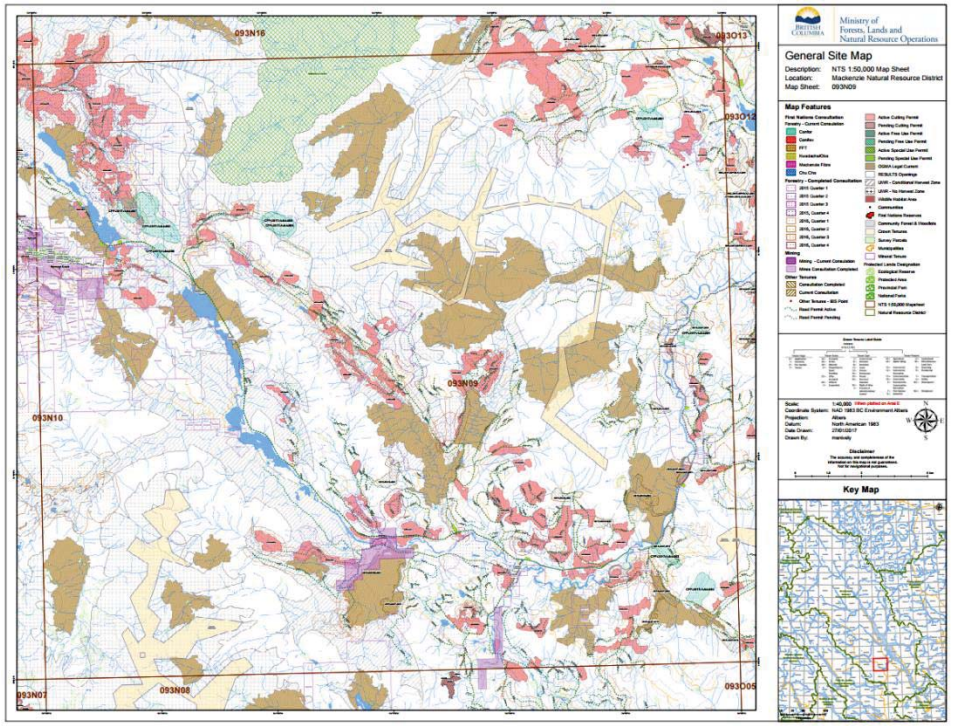
Habitat Zones are the areas in which habitat occurs with the range of fishers in the province. There are different stand and landscape conditions and targets identified for each Habitat Zone.



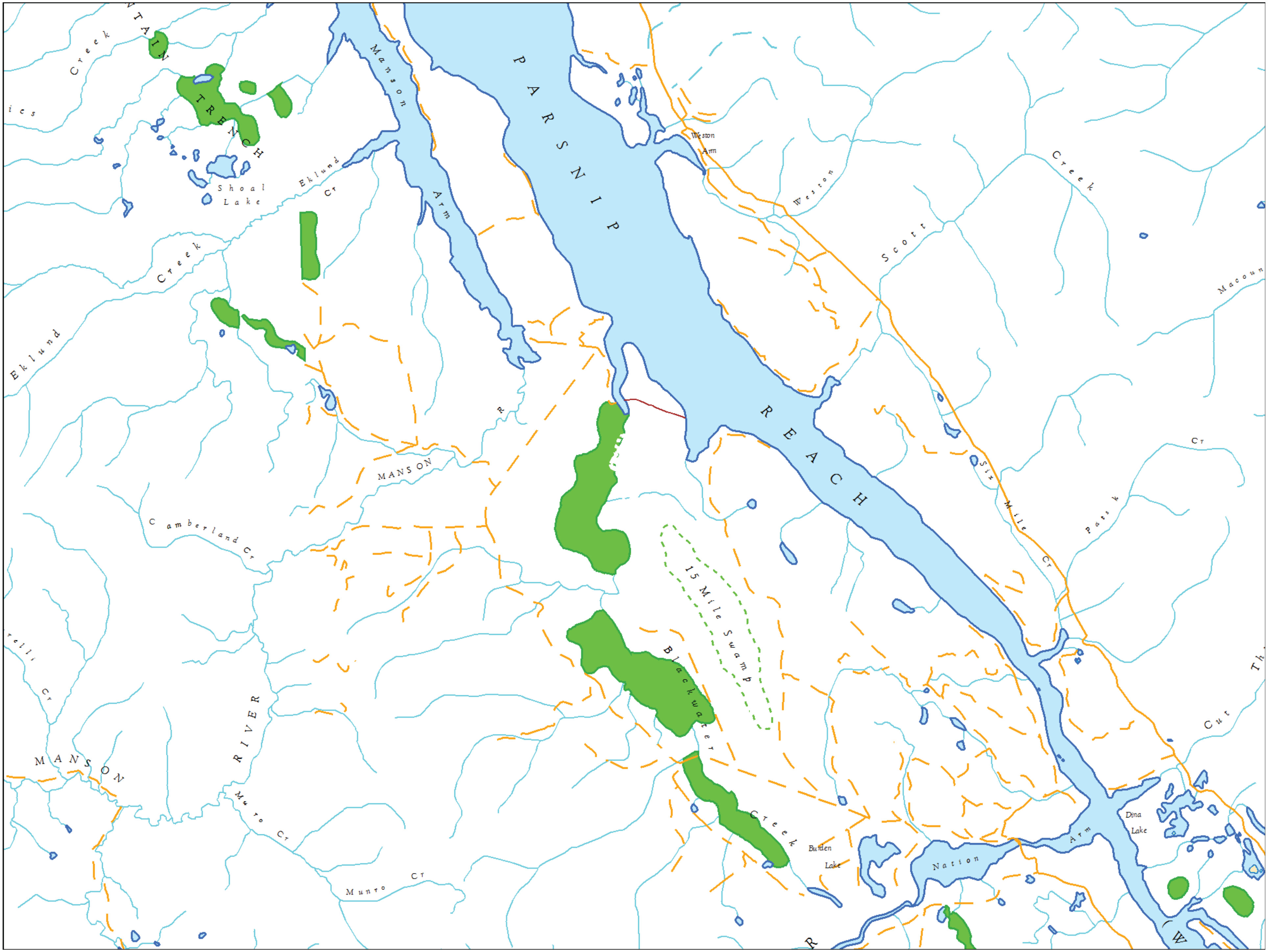
How does this help you?

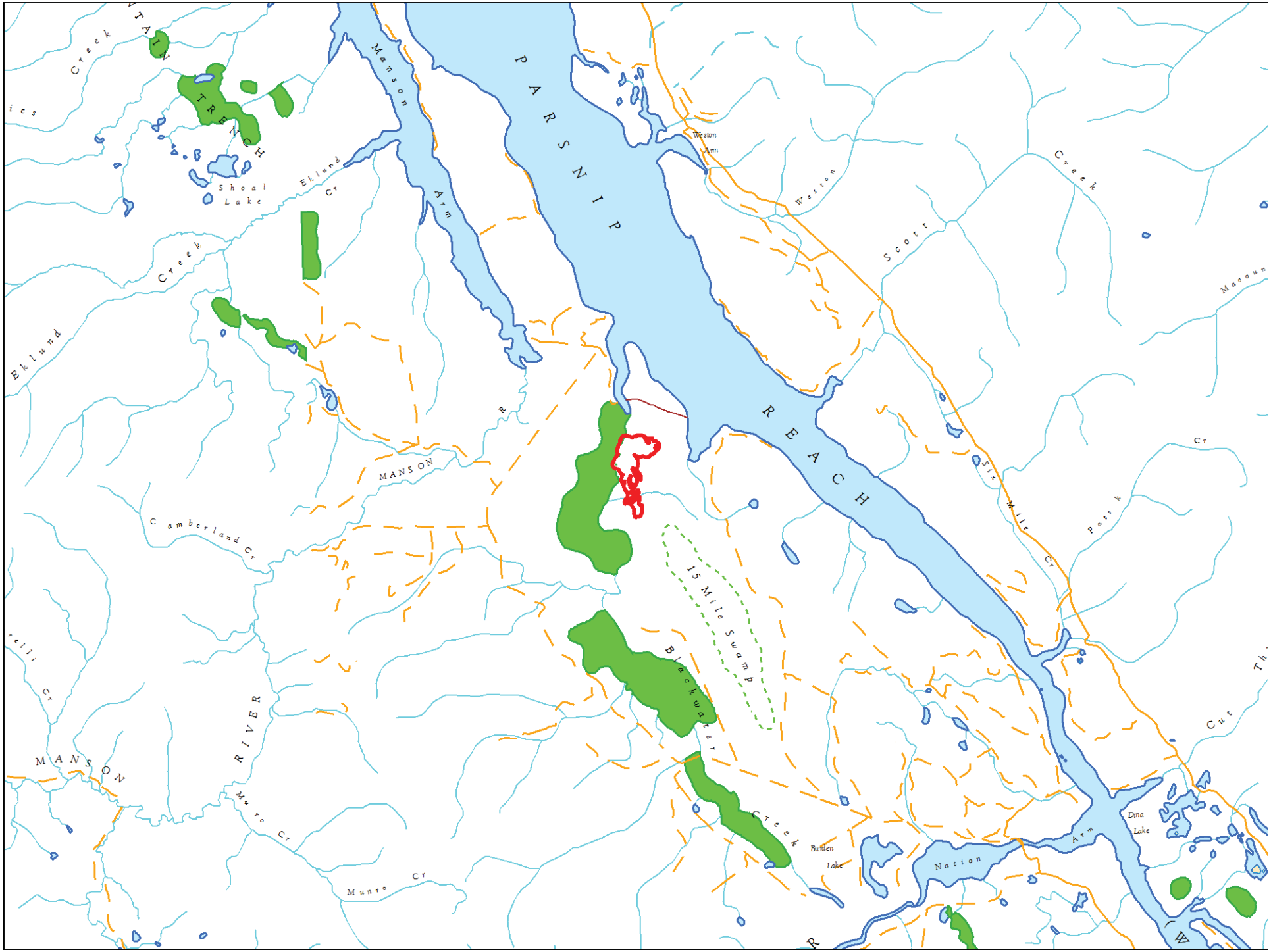
- Allows TKD to make specific suggestions to licensees when responding to proposed timber harvest

a) i.e., in response to: "**Please provide suggestions on how to avoid, mitigate or resolve any identified adverse impacts.**"

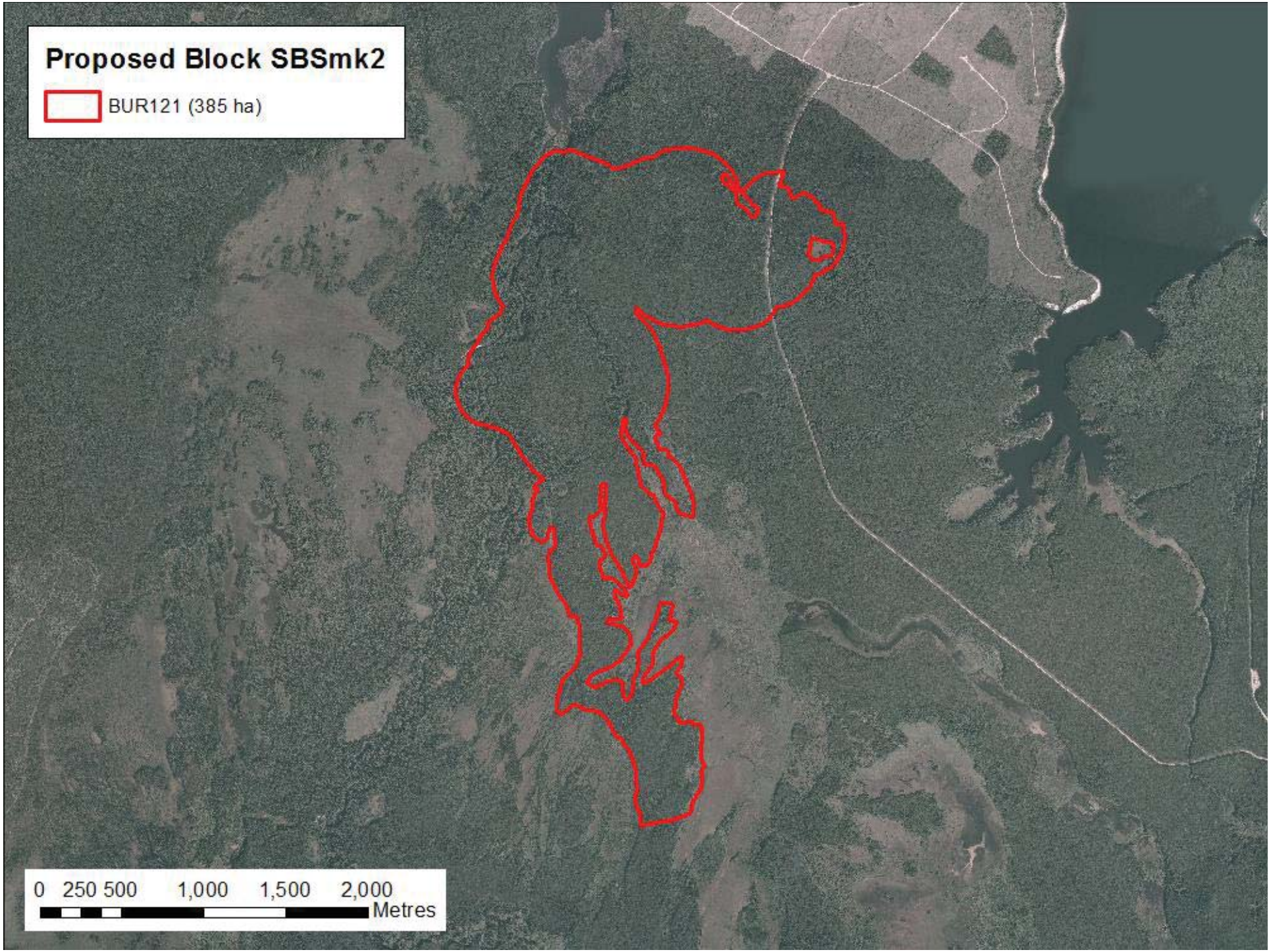


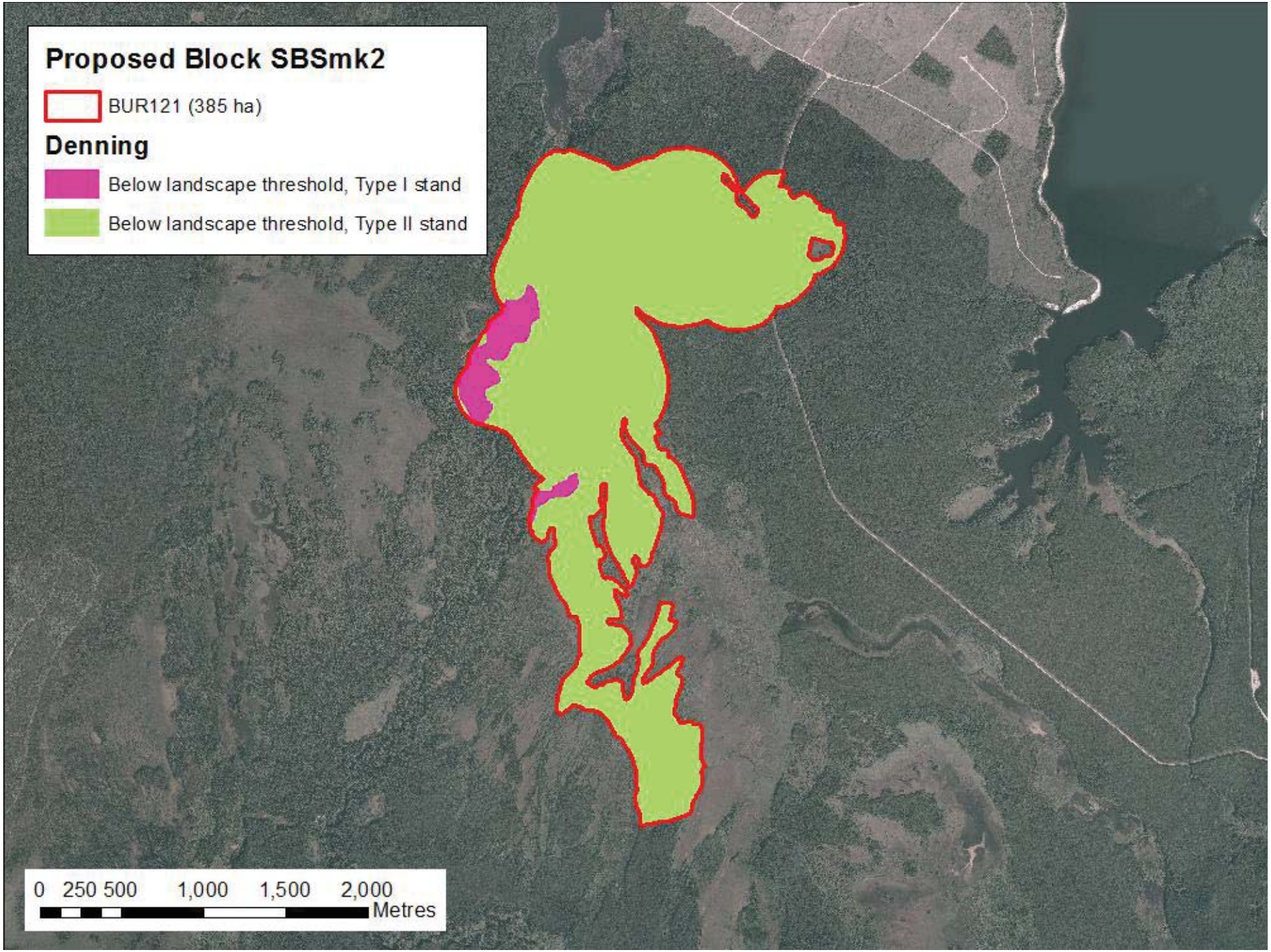
Using Spatial Data to Prepare Responses

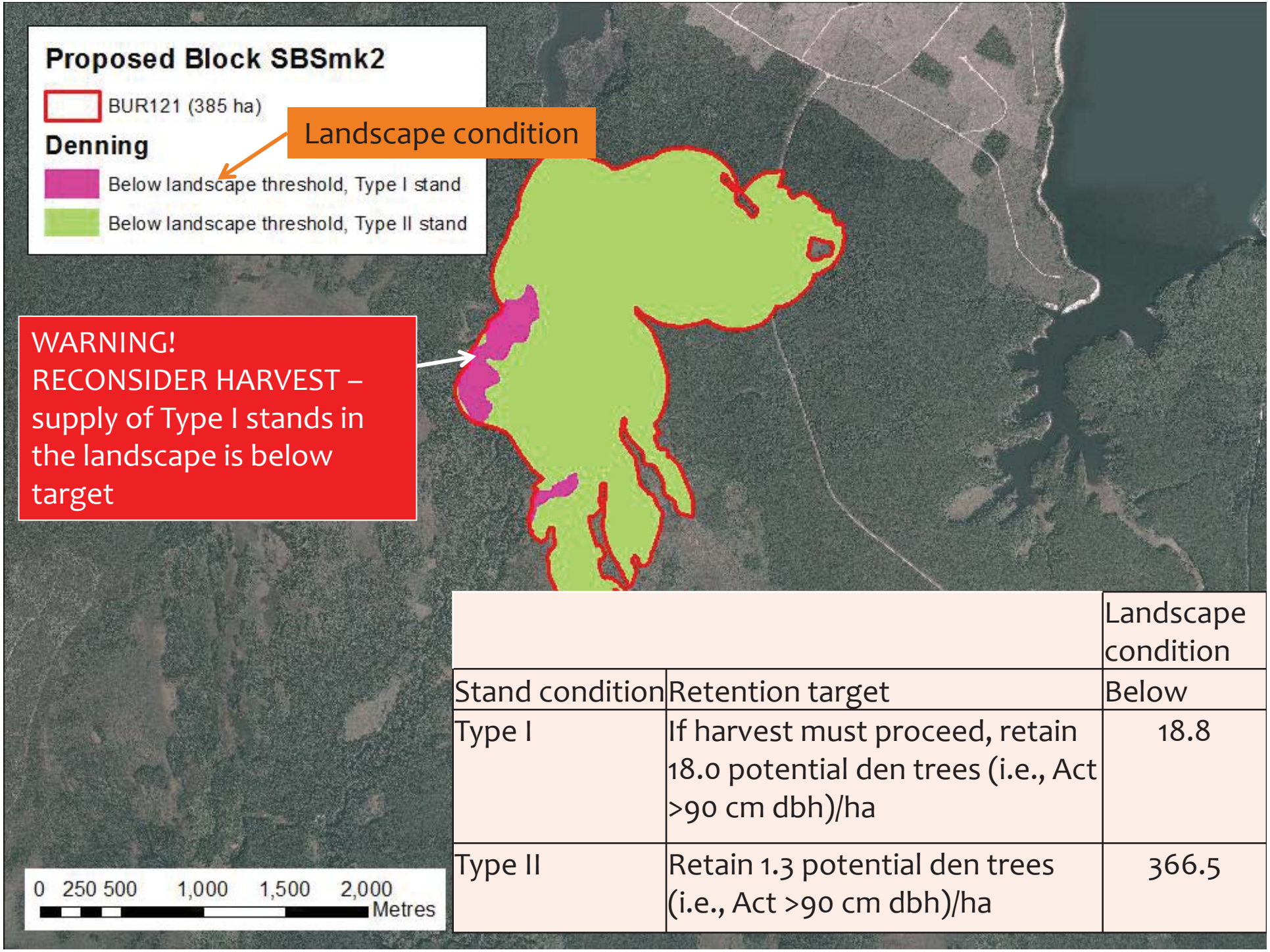

Creek
TRENCH
Shoal Lake
Eklund Cr
Creek
Eklund
Manson Arm
PARSNIP
REACH
Weston Arm
Weston
Creek
Scott
Macoun
MANSON
R
Cumberland Cr
Six Mile Cr
Cr
15 Mile Swamp
Blackwater Creek
Burden Lake
Nation Arm
Dina Lake
Cut
MANSON RIVER
Munro Cr
Munro Cr


PARSNIP
REACH
Manson Arm
Weston Arm
Weston Creek
Scott Creek
Six Mile Cr
Eklund Cr
Eklund Creek
Shoal Lake
TRENCH
MANSON R
Cumberland Cr
15 Mile Swamp
Blackwater Creek
MANSON RIVER
Munro Cr
Burden Lake
Nation Arm
Dina Lake

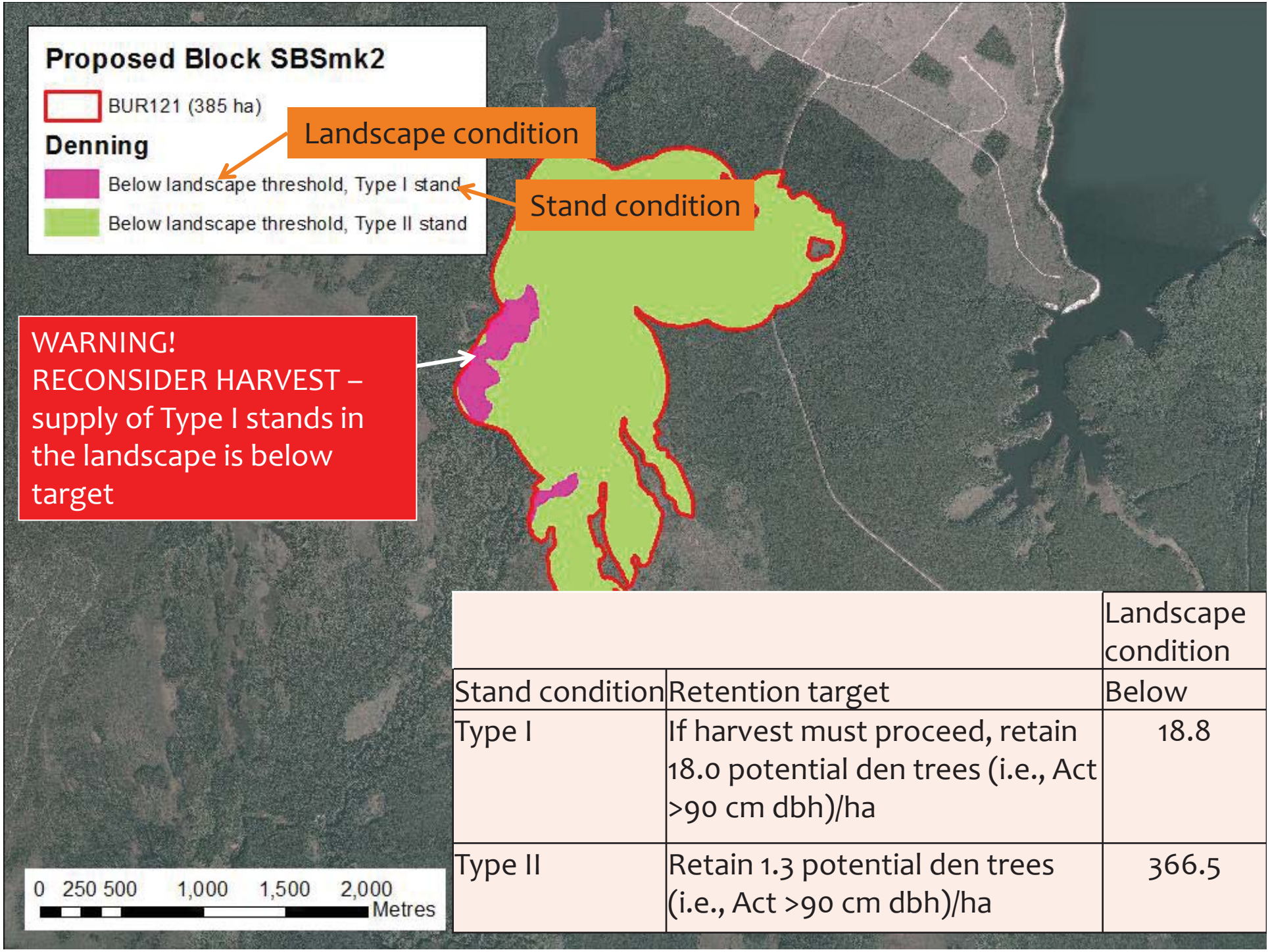

0 250 500 1,000 1,500 2,000
Metres


Proposed Block SBSmk2
BUR121 (385 ha)
0 250 500 1,000 1,500 2,000
Metres

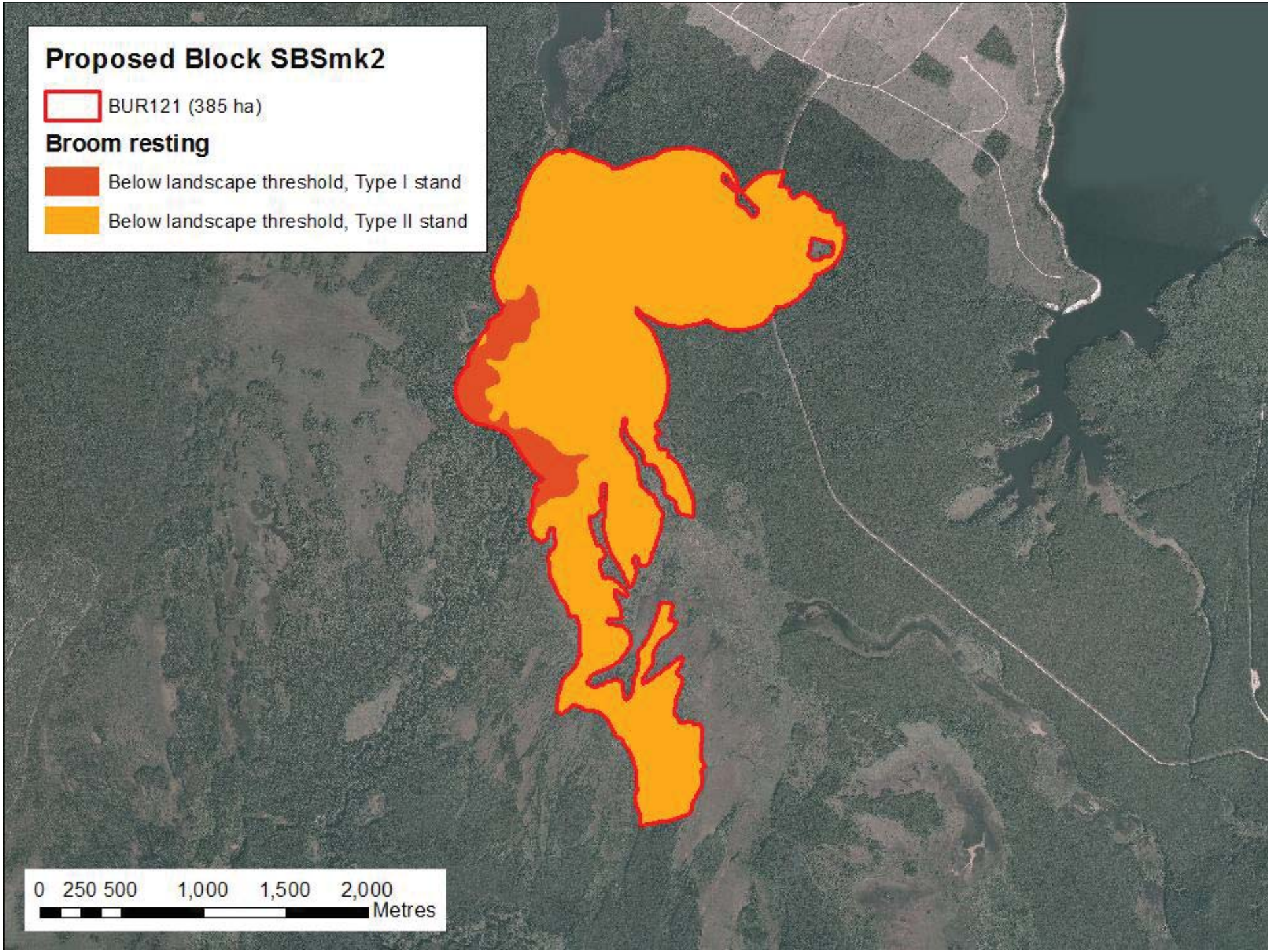

Proposed Block SBSmk2
BUR121 (385 ha)
Denning
Below landscape threshold, Type I stand
Below landscape threshold, Type II stand
0 250 500 1,000 1,500 2,000
Metres

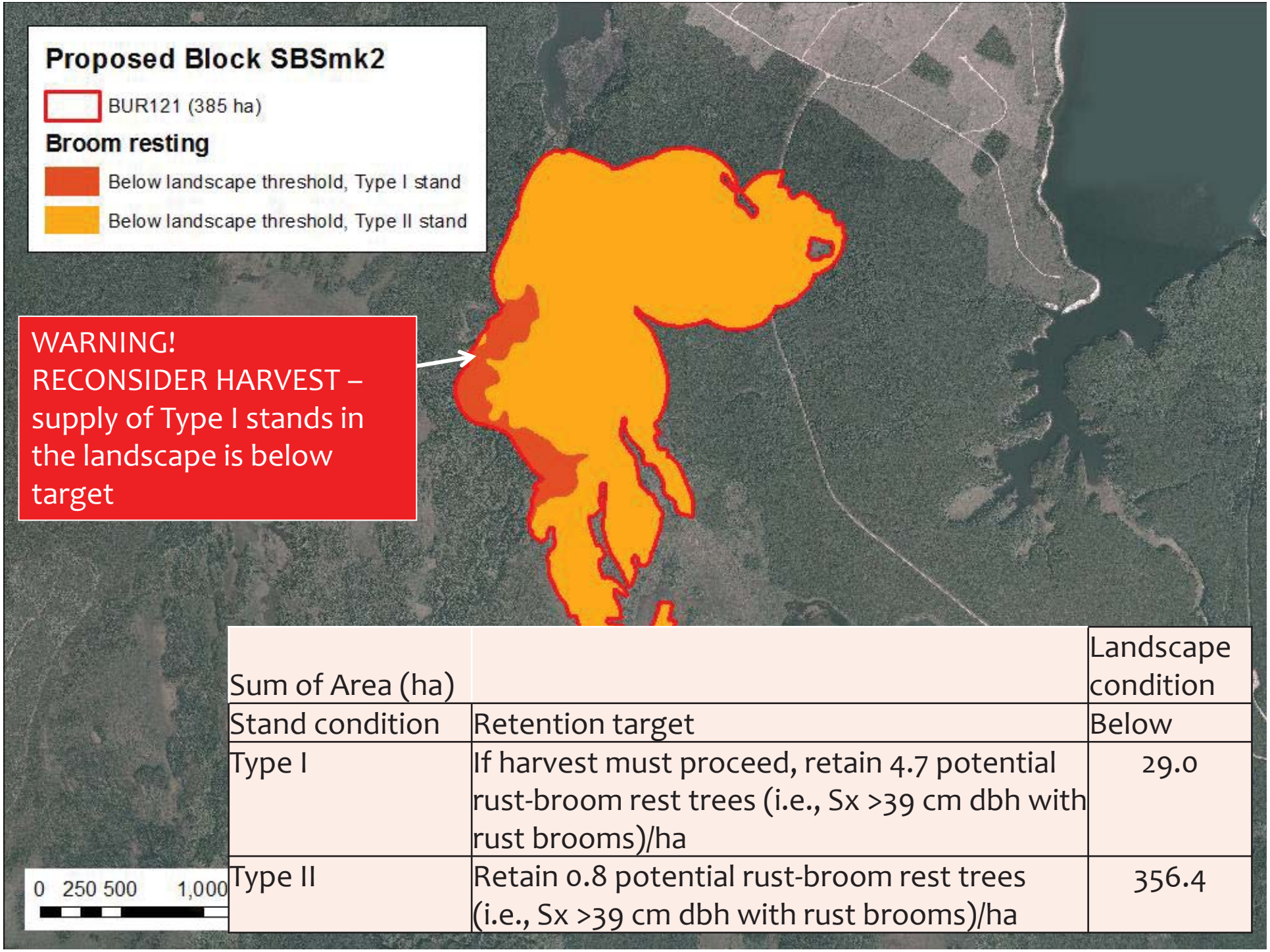


		Landscape condition
Stand condition	Retention target	Below
Type I	If harvest must proceed, retain 18.0 potential den trees (i.e., Act >90 cm dbh)/ha	18.8
Type II	Retain 1.3 potential den trees (i.e., Act >90 cm dbh)/ha	366.5

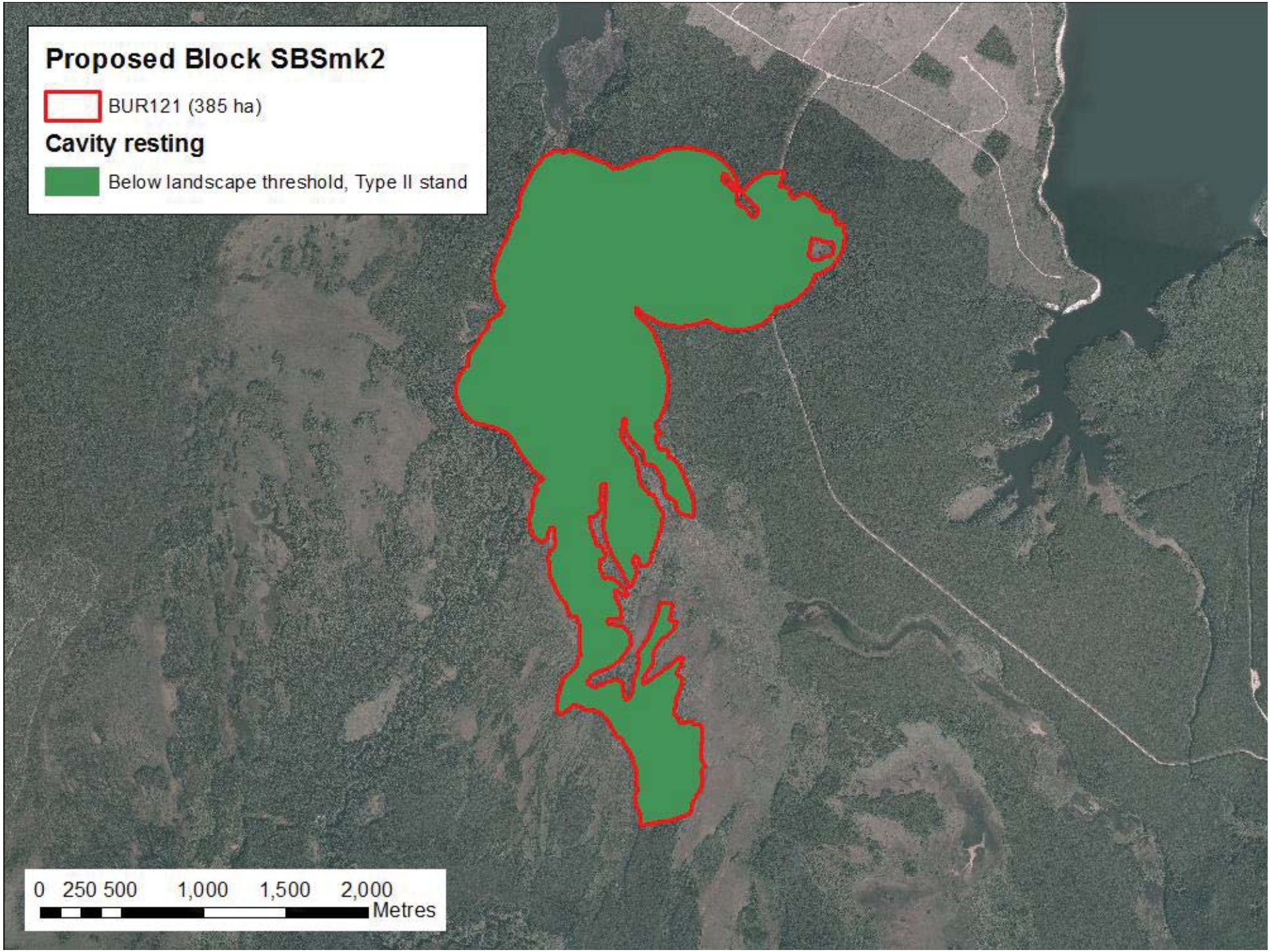


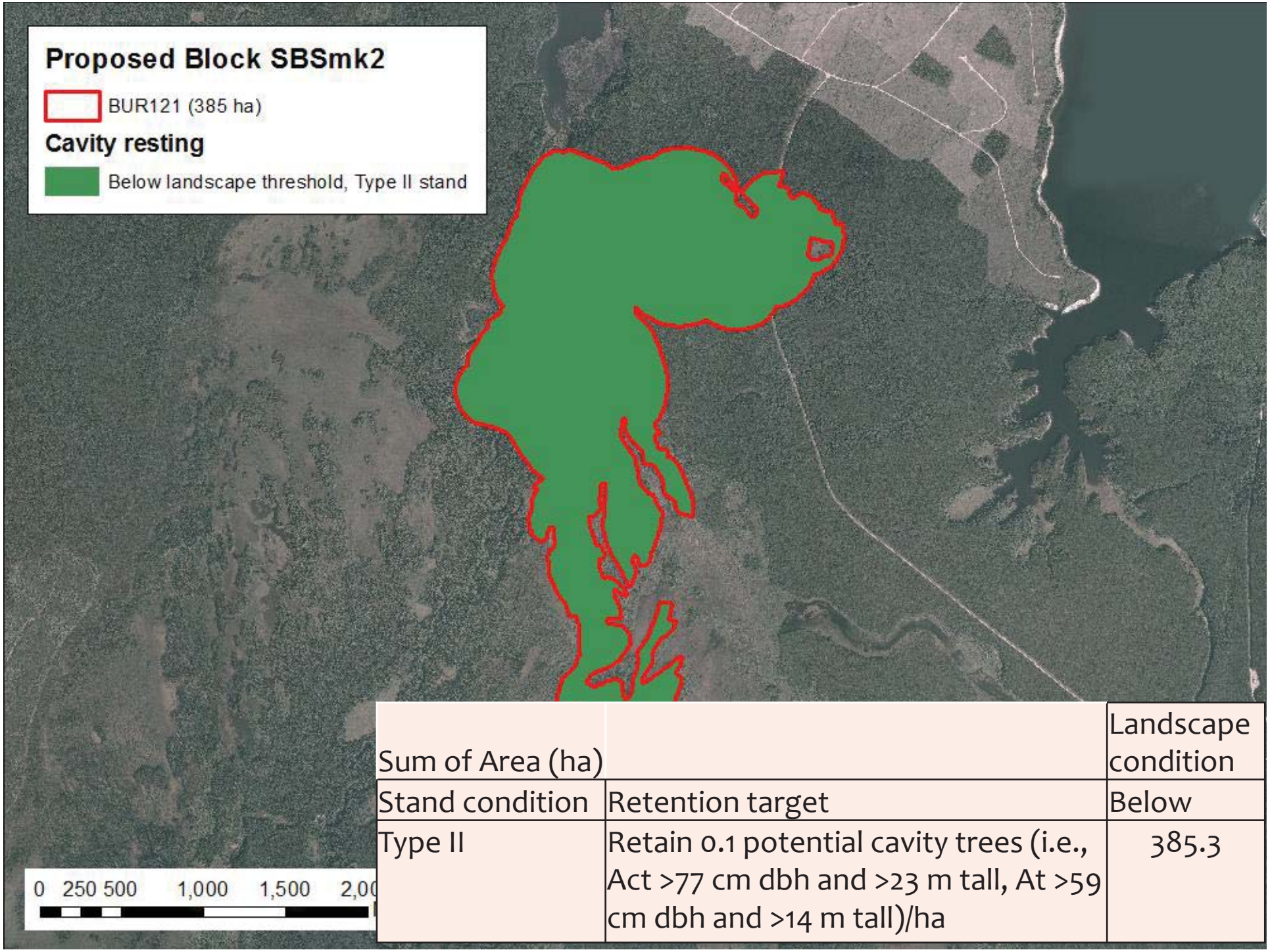
		Landscape condition
Stand condition	Retention target	Below
Type I	If harvest must proceed, retain 18.0 potential den trees (i.e., Act >90 cm dbh)/ha	18.8
Type II	Retain 1.3 potential den trees (i.e., Act >90 cm dbh)/ha	366.5


Proposed Block SBSmk2
BUR121 (385 ha)
Broom resting
Below landscape threshold, Type I stand
Below landscape threshold, Type II stand
0 250 500 1,000 1,500 2,000
Metres

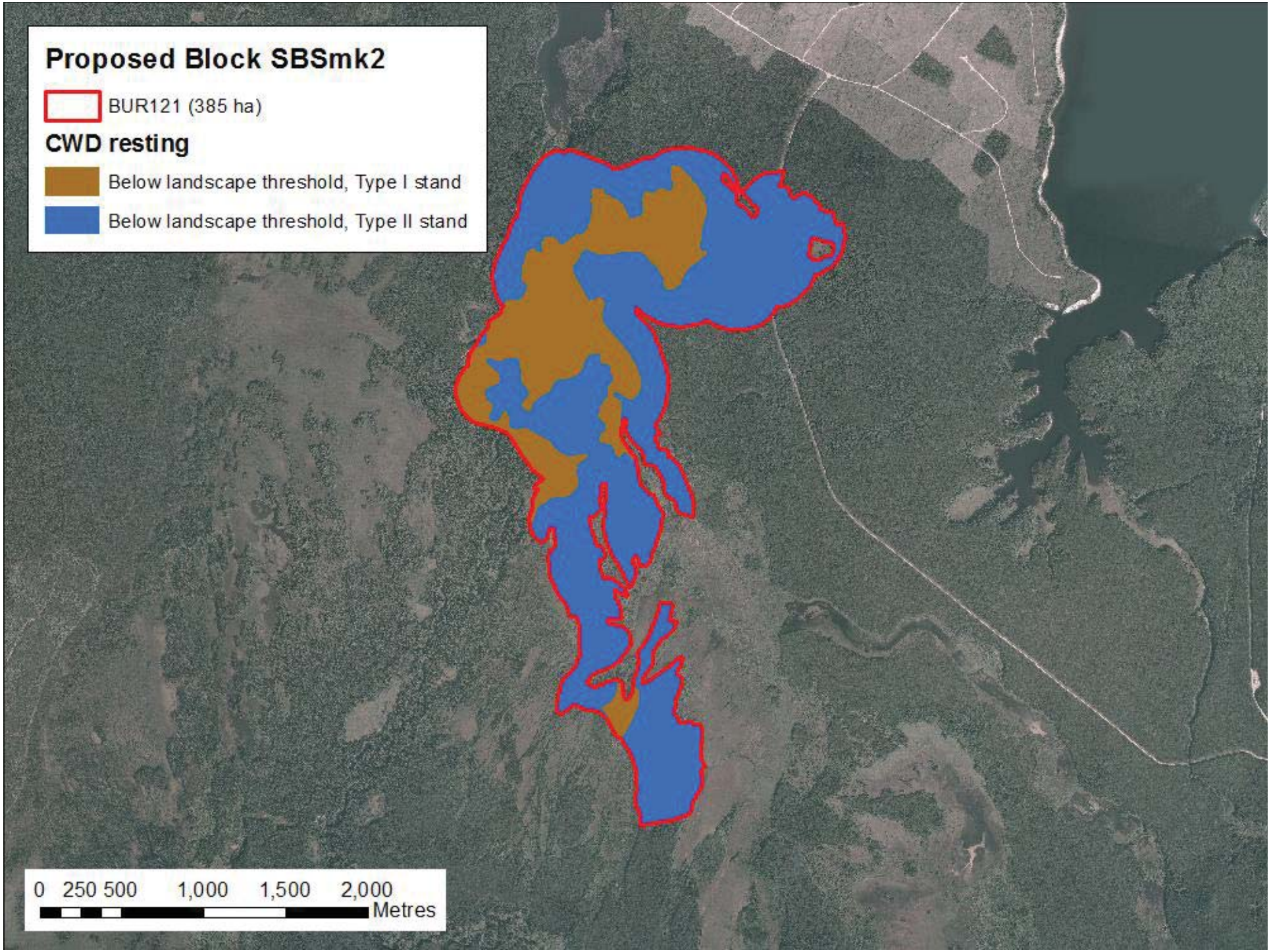


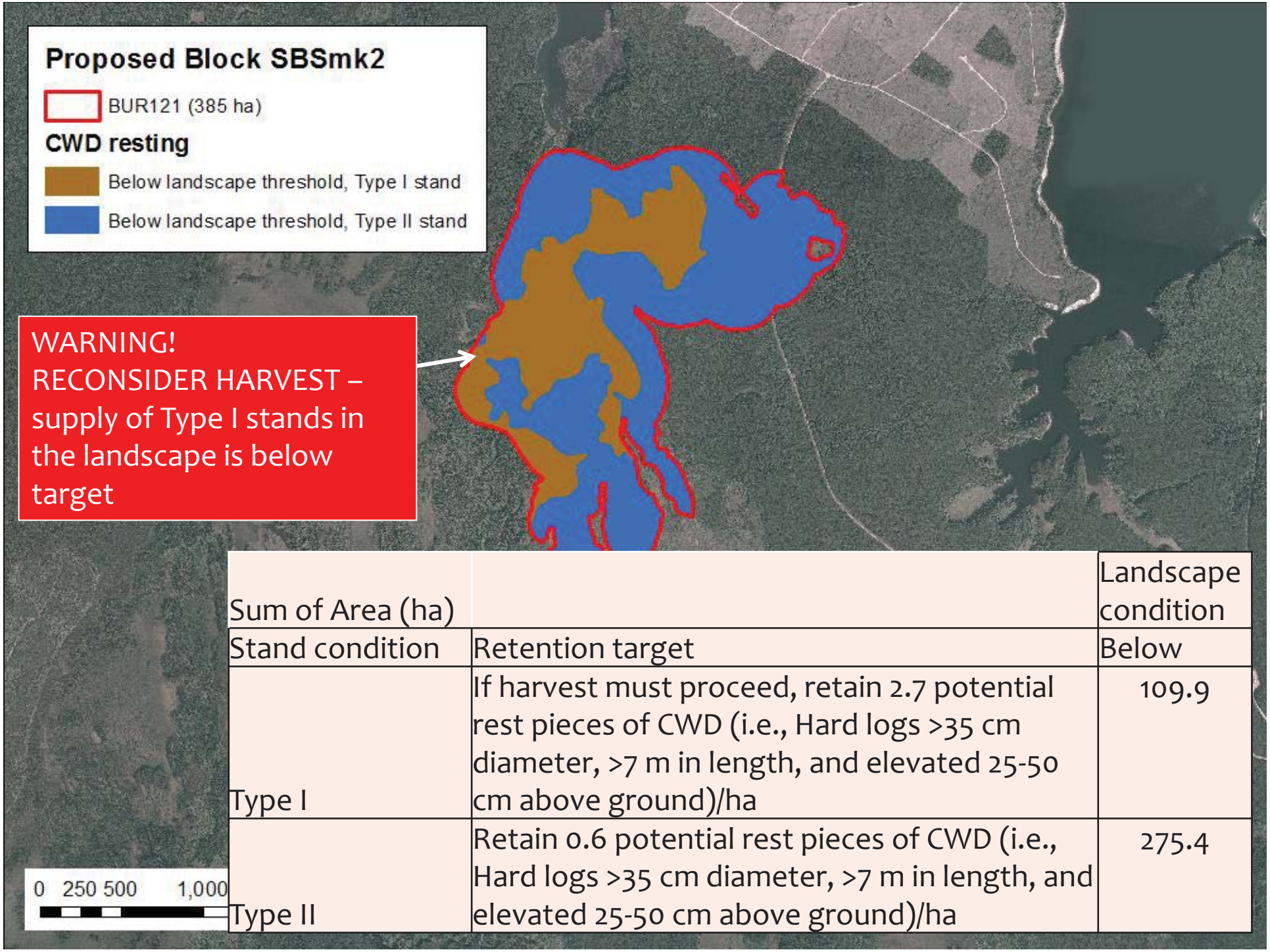
Sum of Area (ha)		Landscape condition
Stand condition	Retention target	Below
Type I	If harvest must proceed, retain 4.7 potential rust-broom rest trees (i.e., Sx >39 cm dbh with rust brooms)/ha	29.0
Type II	Retain 0.8 potential rust-broom rest trees (i.e., Sx >39 cm dbh with rust brooms)/ha	356.4


Proposed Block SBSmk2
BUR121 (385 ha)
Cavity resting
Below landscape threshold, Type II stand
0 250 500 1,000 1,500 2,000
Metres

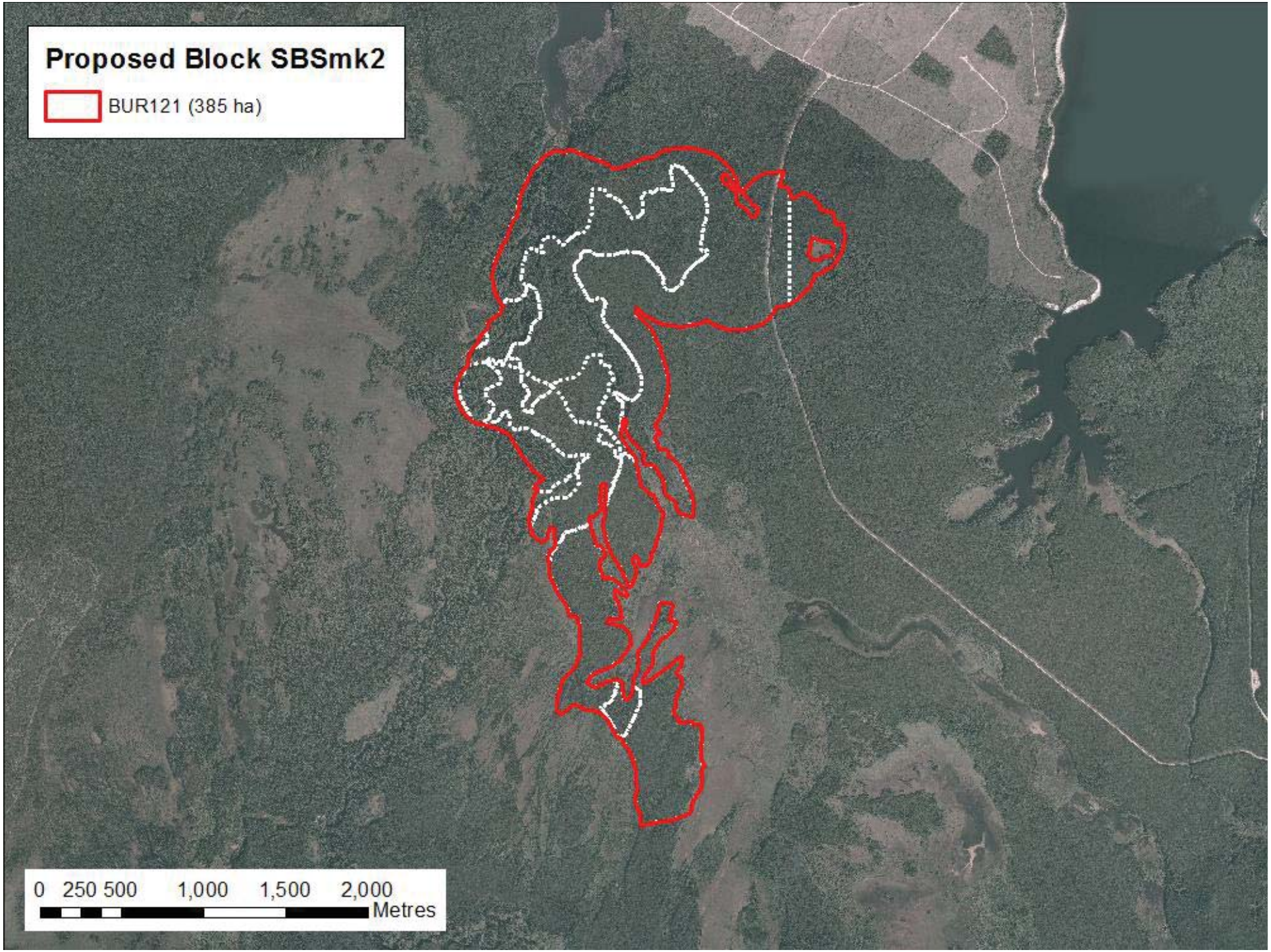


Sum of Area (ha)		Landscape condition
Stand condition	Retention target	Below
Type II	Retain 0.1 potential cavity trees (i.e., Act >77 cm dbh and >23 m tall, At >59 cm dbh and >14 m tall)/ha	385.3


Proposed Block SBSmk2
BUR121 (385 ha)
CWD resting
Below landscape threshold, Type I stand
Below landscape threshold, Type II stand
0 250 500 1,000 1,500 2,000
Metres



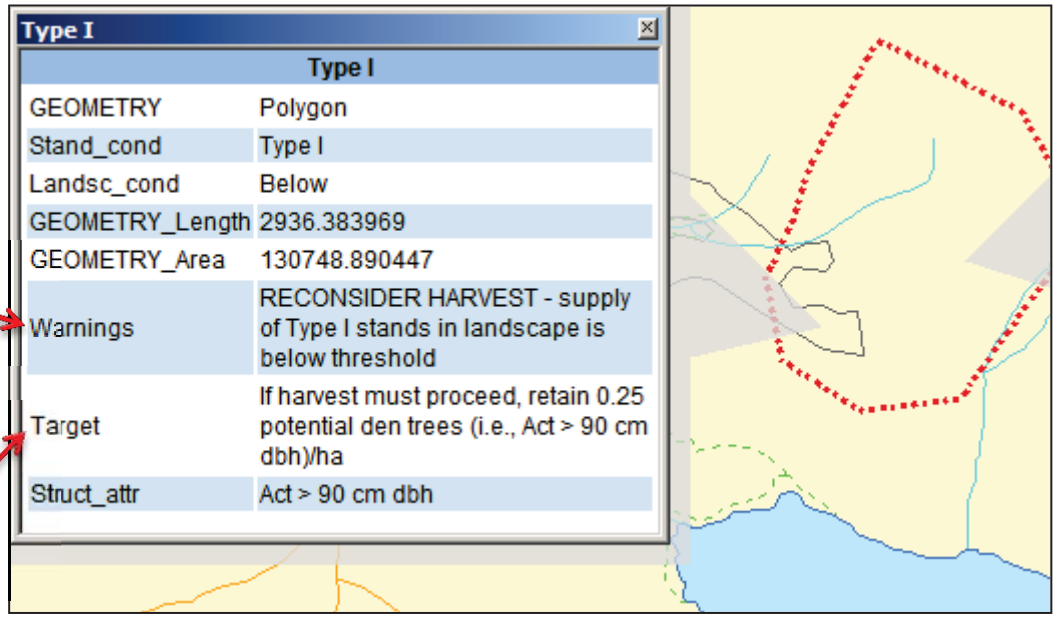
Sum of Area (ha)		Landscape condition
Stand condition	Retention target	Below
Type I	If harvest must proceed, retain 2.7 potential rest pieces of CWD (i.e., Hard logs >35 cm diameter, >7 m in length, and elevated 25-50 cm above ground)/ha	109.9
Type II	Retain 0.6 potential rest pieces of CWD (i.e., Hard logs >35 cm diameter, >7 m in length, and elevated 25-50 cm above ground)/ha	275.4


Proposed Block SBSmk2
BUR121 (385 ha)
0 250 500 1,000 1,500 2,000
Metres

Planning guidance

Helps identify:

- Which stands okay to harvest, which stands to avoid if possible
- Also provide guidance on the density of habitat structures to retain in cutblocks for fishers



Within-stand retention targets: Denning Habitat

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Within-stand retention targets: Denning Habitat

Acb ≥ 90 cm dbh

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Within-stand retention targets: Denning Habitat

Acb ≥ 90 cm dbh

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Within-stand retention targets: Denning Habitat

Acb ≥ 90 cm dbh

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Within-stand retention targets: Denning Habitat

Acb ≥ 90 cm dbh

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Within-stand retention targets: Denning Habitat

Acb ≥ 90 cm dbh

Landscape condition

Stand type	Below	Near	Above
Type I	18	13.5	4.5
Type II	1.3	1.0	0.3

Summary

- Fishers are important forest carnivores in central and northern BC
- Fishers rely on uncommon features of forests that can be affected by forest management
- We are developing tools to help recruit habitat conditions needed by fishers in operational forests in BC

Where to go for resource support

Information and resources are available at:

www.BCfisherhabitat.ca

HABITAT CONSERVATION TRUST FOUNDATION

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

FISH AND WILDLIFE COMPENSATION PROGRAM

A partnership between BC Hydro, the Province of B.C. and Fisheries and Oceans Canada

For more information

Fisher Habitat and Forest Management Web Module

www.BCfisherhabitat.ca

- Rich Weir – Ministry of Environment, Victoria
- Larry Davis – Davis Environmental, Williams Lake
- Inge-Jean Hansen – Dawson Creek